

European Institute of Women's Health CLG

MATERNAL HEALTH IN THE EUROPEAN UNION

EUROPEAN INSTITUTE OF WOMEN'S HEALTH

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List of Abbreviations



BMI	Body Mass Index
CEDAW	Convention on the Elimination of all Forms of Discrimination against Women
EBCOG	European Board and College of Obstetrics and Gynaecologists
EBF	Exclusive Breast-Feeding
ECDC	European Centre for Disease Prevention and Control
EIGE	European Institute for Gender Equality
EFTA	European Free Trade Association
EuMidAs	European Midwives Association
EuMedA	Europeans Medicines Agency
EPMM	Ending Preventable Maternal Mortality
ENAP	Every Newborn Action Plan
EU	European Union
GDM	Gestational Diabetes Mellitus
IMI	Innovative Medicine Initiative
InfAct	Information for Action
IPV	Intimate Partner Violence
MDG	Millennium Development Goal
MMR	Measles Mumps Rubella
OECD	Organisation for Economic Cooperation and Development
PERISTAT	European Perinatal Information System
SARS	Severe Acute Respiratory Syndrome
SBCE	Social, Behavioural and Community Education
SDG	Sustainable Development Goal
SGA	Small for Gestational Age
UK	United Kingdom
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
WHA	World Health Assembly
WFIPP	World Federation of Incontinence and Pelvic Problems
WHO	World Health Organization



Foreward



Foreword

"Maternal Health in the European Union" is the first report of its kind to establish a knowledge base on maternal health in the EU. It does so by drawing together an impressive berth of information on a wide range of related areas, from disease prevention, access to care during pregnancy, to the delivery and the post-delivery periods and infant health and mortality, among others. It reviews ongoing EU



research, data collection and investment in the area of maternal health and summarises current EU policies. The report has been informed by a comprehensive array of statistical and qualitative evidence from all of the Member States, which it analyses in order to document how women's experiences and behaviours differ across the EU.

This report is important in how it records the current discrepancies in the quality of healthcare in the EU and the multiple challenges faced by women as a result of their socio-economic status or geographical location, among other factors. Perhaps even more significantly, the report also provides a comprehensive list of practical recommendations to help deal with these issues, particularly targeted at policymakers. It clearly lays out the laws that need to be revised or enforced and how these changes would positively impact maternal health in the EU. With the wealth of information found here, this report will be a vital resource for healthcare professionals and policymakers alike in their efforts to build an ever-stronger maternal healthcare system.

> Deirdre Clune Member of European Parliament for Ireland South

Foreword

Obstetric care is highly influenced by culture, science and politics, in addition to other contributing factors. This working party explains the widespread differences in perinatal health indicators across the EU.

During my fellowship in the Netherlands, women were surprised by the very high epidural rate for deliveries in France, responding: "Why? It's only a



delivery..." On returning to France, I discussed the discrepancies in my experiences, and women would argue: "Why suffer? Do you have any idea how much deliveries hurt?"

I later had similar discussions on various aspects of maternal health with women, but also with a variety of healthcare professionals throughout Europe. I eventually realised that what is hidden beneath this "obstetric culture" includes political will, gender equality, education, respect, religion, and to some extent in countries where it exists, the equilibrium between our health systems and patients' associations. Importantly, let's not forget the discrepancies in roles of the various members of the multidisciplinary team, such as the tasks of the GPs or midwives, and additionally the variations in funding of obstetric healthcare. These factors result in a very complicated formula that generates the discrepancies in quality of maternal health in Europe.

However, working together in societies such as the European Board and College of Obstetrics and Gynaecologists for medical specialists or European Midwives Association for midwives, helps us to better understand our local difficulties and develop solutions inspired by colleagues from other countries or institutions.

Working together makes us better. Combining our data and comparing ourselves improves our understanding. Sharing our knowledge and challenges improves the care we provide. There are major inequalities in maternal healthcare and indicators throughout Europe. This is not new and will unfortunately continue.

The COVID-19 pandemic and now the war within Europe have deepened the indicator gaps between countries, which demonstrates how maternal health is amongst the first to suffer in times of economic, political and environmental crises.

This report on Maternal Health in the EU is a precious tool to guide healthcare providers, political leaders and patients into better care in the EU and beyond. Are there any other options?

Prof Jacky Nizard EBCOG President 2019

Foreword

EMA was delighted to review this excellent comprehensive report on the Maternal Health in Europe. The understanding that EIWH have in supporting and campaigning for excellence in women's health policies is evident in the report. European Midwives Association believes in upholding respectful, dignified maternal and overarching sexual reproductive health care across Europe. Working in



solidarity and collaboration with other NGOs for evidence-based recommendations is paramount. It is organisations like EIWH that give voice to women, something health professionals cannot do in isolation.

We share the concerns of disparity in access, quality and safety within the delivery of maternal health care and most importantly within the policies that exist on national and EU level. EMA welcomes the extensive background of statistical data and research underpinning the report. These make the recommendations in the end of the report more robust for implementation, building joint action in the world of policy, as well as in the real world of women's lives. This report should make us take notice what can be done to improve the health and lives of women across EU, enabling women to live in a societal environment that recognises needs of different sectors of population and celebrate woman-centred individualised care.

Mervi Jokinen President, European Midwives Association 2009-2021

Executive Summary



Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. Maternal health in the EU is affected by a myriad of factors such as health systems, law, policies, socioeconomic factors, and attitudes of health professionals and users, among others.

The social determinants of health affect maternal outcomes. For example, the risk of adverse health can be influenced by socioeconomic status, poverty, nationality, ethnicity, distance from a health facility, and education. Migrant, refugee and homeless women, among other subgroups of the population, face an additional layer of vulnerability.

A EUROPEAN STRATEGY FOR WOMEN'S HEALTH AND THE EUROPEAN PARLIAMENT WOMEN'S HEALTH INTEREST GROUP

An increasing recognition of specific gender dimensions to health in Europe, and the need for a strategic approach to the health needs and wellbeing of girls and women across the life course, is reflected by a number of comprehensive national Women's Health Strategies in European countries. Many other European countries have been paying marked attention and developing significant new policies targeting specific areas of women's health.

The EIWH's recent establishment and launch of the Women's Health Interest Group at the European Parliament in October 2023 is further indication of increased momentum at European level towards an EU women's health strategy, and a drive towards gender equity in European health care. The Women's Health Interest Group is supported by EIWH's 2024 Manifesto which calls for an EU Strategy on Women's Health.¹ It recognises significant challenges and inequalities in maternal health and care access, provision, and outcomes, particularly for women from migrant and ethnic minority backgrounds. The manifesto includes a call to advocate for and implement European standards of maternal care, while highlighting other areas to address such as obesity, which during pregnancy is a risk factor for adverse pregnancy outcomes, and is associated with negative long-term health outcomes for both mothers and offspring. Pregnancy is a key moment in women's lives which requires a specific focus on health and in turn provides opportunities for addressing health vulnerabilities and reducing health inequalities, ensuring fewer vulnerable women fall through gaps in health provision.

The launch of the Women's Health Interest Group comes as a pivotal step towards effectively shaping an EU Strategy for Women's Health and advocating for gender equity in health issues across Europe. By bringing together key stakeholders, policymakers, experts, and advocates, this interest group aims to drive meaningful change in the landscape of women's health. The objective of establishing the Women's Health Interest Group is to embed women's health in the work of the European Parliament by uniting a diverse group of Members of the European Parliament (MEPs) to promote the best possible access to prevention, treatment and healthcare for all women in Europe. ²

¹ EIWH (2023) *EU Manifesto for Women's Health*. https://eurohealth.ie/wp-content/uploads/2023/07/EIWH-Manifesto-for-Womens-Health-6.pdf.

² Women's Health Parliamentary Interest Group (2023) *Launch of Women's Health Parliamentary Interest Group*. https://agenda. euractiv.com/events/womens-health-parliamentary-interest-group-launch-event-255299

KEY FINDINGS

Facts and Figures

- Between 2000 and 2017 within the European Region, the maternal mortality rate (MMR) decreased by almost half from 27 to 13 deaths per 100,000 live births respectively. Women categorised as having "non-western" origin are at a 60% higher rate of maternal mortality.³
- ▲ The perinatal mortality ratio differs significantly between countries, and the ratio is approximately 35 times higher in some countries in the European Region.
- ▲ There are on average 1.53 live births per woman in the EU, ranging from 1.14 in Malta, to 1.84 in France (2021).⁴ The average age of a woman at birth of first child in the EU was 29.7 in 2021.⁵
- ▲ A crucial time of high risk is during birth and in the first month of the baby's life. The three most prevalent causes of maternal death identified were embolism, hypertensive disease of pregnancy, and haemorrhage.
- ▲ Just under 5% of births took place in the women's home. One notable exception is The Netherlands, where 15% of births took place in the woman's home.⁶
- Rates of stillbirth, and neonatal and infant death, are lower for babies in the EU than in other parts of the world.
- 1/10 women in the EU do not have access to health services in their first months of pregnancy.⁷ Two thirds of new-born deaths could be prevented with appropriate care.
- Between 2011 and 2021, the infant mortality rate in the EU-27 fell from 3.8 deaths per 1,000 live births to 3.2 deaths per 1,000 live births. Extending the analysis to the last 20 plus years, the infant mortality rate was halved (6.6 deaths per 1,000 in 1998).⁸

CONCEPTUALISING MATERNAL HEALTH

There has been recent global recognition of a paradigm shift in the maternal health agenda from preventing maternal deaths to promoting women's health and wellness, given the links between chronic conditions, morbidity in pregnancy, and long-term health.⁹ In this paradigm, pregnancy is viewed as a window of opportunity into the current and future health of women, offering a critical entry point for women who may otherwise not seek or have access to care for chronic conditions.

³ WHO Maternal and Newborn Health Data and Statistics <u>https://gateway.euro.who.int/en/indicators/hfa_97-1220-estimated-maternal-mortality-per-100-000-live-births-whounicefunfpa-estimates/#</u> (accessed 14.11.2023)

⁴ EUROSTAT Fertility Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> (accessed 14.11.2023)

⁵ EUROSTAT Fertility Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> (accessed 14.11.2023)

⁶ Access to maternal care and midwifery services for vulnerable populations. EU 2019 <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁷ WPL (2018) Improving Maternal Healthcare for Vulnerable Women in EU28. What can you do? Women Political Leaders Global Forum, p.13./ o <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁸ Eurostat Mortality and life expectancy statistics 2021 <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mortality_and_life_expectancy_statistics#Infant_mortality</u>

⁹ Firoz, T., McCaw-Binns, A., Filippi, V., Magee, L.A., Costa, M.L., Cecatti, J.G., Barreix, M., Adanu, R., Chou, D., Say, L. and (2018), A framework for healthcare interventions to address maternal morbidity. Int J Gynecol Obstet, 141: 61-68. <u>https://doi.org/10.1002/ ijgo.12469</u>

SECTION ONE: THE MATERNAL HEALTHCARE JOURNEY

One: Public Health, Health Promotion and Disease Prevention

- Between 11% and 30% of pregnant women either smoke or are passively exposed to tobacco smoke. The Republic of Ireland had the highest estimated prevalence of smoking during pregnancy globally (38.4%, 95% CI 25.4–52.4).
- Estimates suggest a prevalence of 25.2% for alcohol use during pregnancy (any amount) in the WHO European Region. In Europe, the highest rates of alcohol consumption for this group were in Ireland where 60.4% of pregnant women consume alcohol during their pregnancy, a figure which is six times the global average.^{10,11,12} Alcohol consumption during pregnancy endangers the infant's physical and mental health and is associated with a wide spectrum of disorders.
- ▲ The prevalence of maternal obesity varies from 7% to 25% and seems strongly related to social and educational inequalities.¹³ Maternal underweight, overweight, and obesity have been associated with a higher risk of miscarriage.
- Nearly half of pregnancies in the EU are unplanned, with estimations ranging from 34% in Western Europe to 54% in Eastern Europe.¹⁴
- ▲ In the EU, even in countries with the highest fertility rates, birth rates are below the level required to avoid population decline.
- There is a need for behaviour change programmes during pregnancy that aim to empower women. Midwives should develop, manage, implement or support behaviour change programmes during pregnancy.¹⁵ Examples of such behaviour change interventions include counselling and education. Evidence shows that the health of a woman's baby was a major motivating factor to adopting a healthier lifestyle.

Two: Access to Care and Information

- Maternal health outcomes in Central and Eastern Europe (CEE) compare unfavourably with those in Western Europe, despite macro-indicators that suggest well-designed maternal care systems.¹⁶ This is due to barriers such as the lack of skilled professionals, up-to-date care and equipment; distance and travel costs to facilities in remote areas; care is often expert-centred with poor attitude towards patients; women are lacking information, autonomy and trust of medical doctors; and the inability to pay the high (in)formal payments.
- Legal and policy analysis of EU Member States highlights substantial health care inequities faced by undocumented migrant women, who in turn, have poorer maternal health outcomes

¹⁰ European Alcohol Policy Alliance (Eurocare). 2013. Alcohol and pregnancy. <u>http://www.eurocare.org/resources/policy_issues/</u> <u>alcohol_and_pregnancy</u>

WHO Europe. 2016. Prevention of harm caused by alcohol exposure in pregnancy. <u>http://www.drugsandalcohol.ie/26073/1/</u> WHO_Prevention-harm-caused-alcohol-exposure-pregnancy.pdf.

¹² O'Sullivan, Claire. 17 Jan 2017. "Ireland tops list for pregnant women drinking." The Irish Examiner. <u>http://www.irishexaminer.com/</u> <u>ireland/ireland-tops-list-for-pregnant-women-drinking-439408.html</u>.

¹³ Devlieger, R., Benhalima, K., Damm, P., Van Assche, A., Mathieu, C., Mahmood, T., ... & Bogaerts, A. (2016). Maternal obesity in Europe: where do we stand and how to move forward?: A scientific paper commissioned by the European Board and College of Obstetrics and Gynaecology (EBCOG). European Journal of Obstetrics & Gynecology and Reproductive Biology, 201, 203-208.

ESHRE Capri Workshop Group, (2018) Why after 50 years of contraception do we still have unintended pregnancy? A European perspective. Human Reproduction, Vol. 33, No.5 pp. 777-783. <u>https://doi.org/10.1093/humrep/dey089</u>

¹⁵ Laura A. Zinsser, Kathrin Stoll, Frank Wieber, Jessica Pehlke-Milde, Mechthild M. Gross, (2020). Changing behaviour in pregnant women: A scoping review, Midwifery, Volume 85, 102680, ISSN 0266-6138, <u>https://doi.org/10.1016/j.midw.2020.102680</u>.

¹⁶ Elina Miteniece, Milena Pavlova, Bernd Rechel, Wim Groot, (2017). Barriers to accessing adequate maternal care in Central and Eastern European countries: A systematic literature review, Social Science & Medicine, Volume 177, Pages 1-8, ISSN 0277-9536, <u>https://doi.org/10.1016/j.socscimed.2017.01.049</u>

compared to other women in Europe. On average, in western and southern Europe, only a quarter of migrants know their rights to access care and only half know how to navigate the health system.

- Midwife-led care has been shown to contribute to the safety and quality of women's care in the domains of safety, effectiveness, woman-centeredness, and efficiency.¹⁷
- ▲ Literacy and health literacy must be taken into consideration by health care professionals (HCPs). It is important that accurate health information is communicated in an accessible way to patients and their carers. Limited health literacy is associated with unhealthy behaviours.

Three: Birth, Labour and Delivery

- Maternal deaths in the EU are rare. However up to half of maternal deaths are associated with poor quality or substandard care, and groups such as migrant women experience greater morbidity and mortality.
- ▲ There are increasing calls for maternal care that views birth as a normal physiological event, and which centres the women's experiences and needs during birth.
- ▲ Vast differences in the mode of delivery across Europe have persisted since 2010.^{18,19} The median caesarean section rate is 25.7 % across the EU.²⁰ The high proportions of births across the EU which have used a medical and/or surgical intervention, as well as variation between EU Member States,²¹ calls into question the necessity of interventions in all instances. Evidence shows that caesarean sections may be 'inappropriate' and due in part to maternal preference or provider preference. Higher rates of caesarean section are seen in the private sector. As a surgical procedure, caesarean section itself is associated with risk during the delivery as well as having implications for future pregnancies.
- Between the 2010 and 2015, trends toward later age at childbirth (mothers aged 35 years or older) increased across Europe by 16%.
- Breastfeeding exclusively in the first six months is established as important for nutrition and bonding.^{22,23} It also ensures the best conditions for growth and development and lowers children's risks of non-communicable diseases in later years.²⁴ The WHO European Region is the region with the lowest levels of exclusive breastfeeding (EBF), at the age of 6 months with approximately 25%. Protecting, promoting, and supporting breastfeeding is a public health

¹⁷ Sandall J, Devane D, Soltani H, Hatem M, Gates S. Improving quality and safety in maternity care: the contribution of midwife-led care. J Midwifery Women's Health. 2010 May-Jun;55(3):255-61. doi: 10.1016/j.jmwh.2010.02.002. PMID: 20434086.

¹⁸ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

¹⁹ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

²⁰ WHO, 2021. Cesarean section rates continue to rise, amid growing inequalities in access. <u>https://www.who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access</u>

Peristat, 2018. <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

²² WHO Europe. 2020. *Maternal and Newborn Health*. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>

²³ WHO (2020) New WHO tools to support health-care workers promoting breastfeeding in Europe <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/news/news/2020/8/new-who-tools-to-support-health-care-workers-promoting-breastfeeding-in-europe</u>

²⁴ WHO Fact sheet - Breastfeeding and Obesity <u>https://www.euro.who.int/en/health-topics/noncommunicable-diseases/obesity/data-and-statistics/fact-sheet-breastfeeding-and-obesity</u>

priority.²⁵ Across the EU, mothers with higher education levels both initiate breast-feeding and practise EBF for longer, a trend which is linked with maternity and parental leave policies.

Four: Health Condition Management

Health and lifestyle affect fertility, maternal health, and child development. Healthy lifestyles and well-being are important for managing conditions²⁶ to ensure healthy outcomes for both mother and child.

- Pregnant women who have diabetes should maintain close contact with their doctor over the course of the pregnancy. Women with type 1 or type 2 diabetes who have uncontrolled or undiagnosed diabetes during pregnancy are at increased risk of complications which can affect the health of the mother and the foetus.
- Gestational Diabetes Mellitus (GDM): GDM is a form of diabetes that occurs during pregnancy, usually developing during the latter half of pregnancy.²⁷ GDM is estimated to occur in 3.8 to 7.8% of pregnancies in Europe²⁸ and its prevalence appears to be increasing.²⁹ There is currently no consensus across EU Member States on testing, diagnostic procedures, and screening.³⁰ Children born to women who suffered from GDM over the course of their pregnancy are six times more likely to develop type 2 diabetes than children born to mothers who did not develop GDM.³¹
- A Hypertensive disorders of pregnancy, particularly pre-eclampsia, increase the future risk of hypertension, stroke, cardiovascular disease, and premature death.
- ▲ In high income countries, mortality rates among pregnant women are generally low, but heart disease has been identified as the leading cause of death during pregnancy.³²
- Women are more likely to develop urinary incontinence compared to men, for example as a result of post-partum complications.
- ▲ The iron status of women worsens in pregnancy without iron supplementation. In Europe, the majority of pregnant women have a dietary iron intake which is markedly below the recommended intake, contributing to a low iron status in many pregnant women.
- Caesarean delivery has been used as a precautionary measure in COVID-19 infected mothers and there is a paucity of evidence regarding transmission of COVID-19 during breastfeeding. As pregnant women are considered a vulnerable and high-risk group for COVID-19, efforts must be also made to study the safety of immunising pregnant women against coronavirus during the vaccination development. Pregnant individuals were found to be at a heightened risk of more severe symptoms of COVID-19 than people who are not pregnant.

²⁵ Theurich MA, Davanzo R, Busck-Rasmussen M, Díaz-Gómez NM, Brennan C, Kylberg E, Bærug A, McHugh L, Weikert C, Abraham K, Koletzko B. Breastfeeding Rates and Programs in Europe: A Survey of 11 National Breastfeeding Committees and Representatives. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):400-407. doi: 10.1097/MPG.00000000002234. <u>https://pubmed.ncbi.nlm.nih.gov/30562307/</u>

²⁶ WHO Europe. 2020. *Maternal and Newborn Health*. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>

²⁷ Diabetes UK. 2015. *Diabetes News.* https://www.diabetes.org.uk/about_us/news/gestational-diabetes-and-children

²⁸ Eades, Claire E., Dawn M. Cameron, and Josie MM Evans. "Prevalence of gestational diabetes mellitus in Europe: A metaanalysis." *Diabetes Research and Clinical Practice* 129 (2017): 173-181. <u>https://pubmed.ncbi.nlm.nih.gov/28531829/</u>

²⁹ Buckley, Brian S., Jürgen Harreiter, Peter Damm, Rosa Corcoy, Ana Chico, David Simmons, Akke Vellinga, and Fidelma Dunne. "Gestational diabetes mellitus in Europe: prevalence, current screening practice and barriers to screening. A review." *Diabetic medicine* 29, no. 7 (2012): 844-854. <u>https://doi.org/doi:10.1111/j.1464-5491.2011.03541.x</u>

³⁰ Diabetes Ireland. 2017. *Gestational Diabetes.* https://www.diabetes.ie/living-with-diabetes/diabetes-pregnancy/gestational-diabetes/

³¹ Diabetes UK. 2015. *Diabetes News.* https://www.diabetes.org.uk/about_us/news/gestational-diabetes-and-children

³² Hughes, Sue. "Heart Disease Is Lead Cause of Death in Pregnancy." *Medscape*, September 13, 2012. https://www.medscape.com/viewarticle/770901. <u>https://www.medscape.com/viewarticle/770901</u>

- Group B streptococcus is found in about one third of adults and about one-quarter of pregnant women; it is not harmful to adults and those infected are typically asymptomatic. However, Group B Strep is a life-threatening disease infection in new-borns, making infants that contract the infection during labour susceptible to harmful diseases including meningitis, sepsis, and pneumonia, which can result in long-term health issues and can lead to death. Unfortunately, routine screening for Strep B is not provided to all women across Europe.
- Symptoms of asthma can vary during pregnancy. One-third of women report that their asthma worsens, one-third report that their asthma improves, and one-third report that their asthma remains unchanged.^{33,34} Controlled asthma rarely causes complications during pregnancy. Severe, uncontrolled asthma, however, poses a health threat to both the mother and the foetus.
- Postnatal depression (PND) affects about 20% of women in Ireland every year. The prevalence across Western countries is estimated to vary from 10-15%, with higher rates experienced in low and lower-middle income countries.³⁵ It can develop after any pregnancy up to six months after giving birth; the most common occurrence seems to be six to ten weeks after delivery. More support and information is needed to increase awareness and support women suffering from PND. Efforts must be made to reduce the stigma of depression as well.

Five: Safe Use of Medication

More than 5 million women get pregnant in the EU every year and a majority take at least one medication during pregnancy. Yet there is almost no evidence-based information available on most medications to guide a woman and her healthcare professional on the use of medication in pregnancy and breastfeeding.

- ▲ In 2010, about 140,000 foetuses and babies in the EU-27 had a major birth defect.³⁶ Birth defects are estimated to have accounted for 11% of neonatal deaths in Europe in 2008.
- Only about 5% of available medications have been adequately monitored, tested and labelled for use in pregnant and breastfeeding women.³⁷ Instead, most medicines prescribed for pregnant women are either counter-indicated or used off-label.

SECTION TWO: MATERNAL HEALTH CARE CONTEXT

One: Socioeconomic Support around the Time of Birth

Legal and socioeconomic conditions prevailing in the jurisdiction in which women reside, regarding their employment and social security provisions and entitlements around the time of

³³ "Pregnancy and Asthma." *ACAAI Public Website*. 20 Mar. 2017. <u>https://acaai.org/asthma/asthma-101/who-gets-asthma/pregnancy-and-asthma/</u>

³⁴ Cadeddu, C., S. Capizzi, D. Colombo, M. Nica, and A. G. De Belvis. "Literature review of gender differences in respiratory conditions: a focus on asthma and Chronic Obstructive Pulmonary Disease (COPD)." *Igiene e sanita pubblica* 72, no. 5 (2016): 481-504. <u>https://pdf.manuscriptpro.com/search/Abstract-28068678/1/bcb4b22c/Literature-review-of-gender-differences-inrespiratory-conditions:-a-focus-on-asthma-and-Chronic-Obstructive-Pulmonary-Disease-(COPD).</u>

³⁵ Wang, Z., Liu, J., Shuai, H. *et al.* Mapping global prevalence of depression among postpartum women. *Transl Psychiatry* 11, 543 (2021). <u>https://doi.org/10.1038/s41398-021-01663-6</u>

³⁶ Zeitlin J1, Mohangoo AD, Delnord M, Cuttini M; EURO-PERISTAT Scientific Committee, 2013, "The second European Perinatal Health Report: documenting changes over 6 years in the health of mothers and babies in Europe," *J Epidemiol Community Health*, 67(12): 983-985. doi: 10.1136/jech-2013-203291. https://pubmed.ncbi.nlm.nih.gov/24052513/

³⁷ Allegaert K. Pharmacotherapy during Pregnancy, Childbirth, and Lactation. Int J Environ Res Public Health. 2022 Sep 9;19(18):11336. doi: 10.3390/ijerph191811336. PMID: 36141608; PMCID: PMC9517125.

birth affects maternal health. Despite legal and policy documents, much discrimination can take place against mothers in the workplace.

- EU treaties relate to equal pay and equal treatment at work; and during pregnancy; maternity, paternity, parental and other types of leaves related to work-life balance; occupational pension schemes; statutory schemes of social security; self-employed workers; goods and services; violence and domestic violence; enforcement and compliance. EU laws are transposed into national jurisdictions.
- ▲ Women should be entitled to 14 weeks minimum maternity benefits as directed by EU law. However, there are gaps in this provision. Some countries have not amended their law to comply with Article 8 of Directive 2014/41/EU, including provision of rights and protections for minimum 14 weeks of maternity benefits for female self-employed workers, and female spouses and life partners of self-employed workers. All countries provide for some form of adoption leave, however, eligibility for parental leave is not universally guaranteed within any Member State.³⁸
- According to the OECD Family Database, formal early-education provision is on the increase across EU countries, with the majority of children enrolling in some form of education before age 5. The inequality in formal childcare use is striking in the UK, where children from highly educated mothers are 6 times more likely to be enrolled than children from mothers with low levels of education.
- In Ireland lone parents spend more of their income on childcare costs (16%), as do low-income families (20%), than the average across all families (12%).³⁹
- Maternal employment is still below the overall EU recommended level of 60% in many European countries.

Two: Disparities and Vulnerable Populations

- ▲ An estimated 500,000 women in the EU go through their first months of pregnancy with no access to health services. While infant mortality has decreased significantly in the European Union, some communities continue to be disproportionately affected. Women from migrant, refugee, and Roma communities and women living in poverty are particularly at risk.^{40,41}
- ▲ Socioeconomic position is also inversely associated with stillbirth risk.⁴²
- In a substantial part of Europe, access to healthcare and programmes specifically dedicated to pregnant adolescents is limited, as is access to free contraception. Health services providing SRH adolescent-friendly care and respecting adolescents' rights (e.g., confidentiality and autonomy) are not available in nearly half of European Union countries. In many situations, health professionals providing SRH to adolescents are not trained to meet adolescents' SRH needs.

³⁸ European Institute for Gender Equality (2019) Gender Equality Index 2019: Work-Life Balance. https://eige.europa.eu/areas/ eligibility-parental-leave-factsheets <u>https://eige.europa.eu/publications/gender-equality-index-2019-report/parental-leave-policies</u>

³⁹ Russell et al (2018) Maternal Employment And The Cost Of Childcare In Ireland <u>https://www.esri.ie/system/files/publications/</u> <u>rs73.pdf</u>

⁴⁰ The European Child Guarantee: an opportunity to invest in early childhood development (2021) <u>https://epha.org/the-european-child-guarantee-an-opportunity-to-invest-in-early-childhood-development/</u>

⁴¹ Watson, H.L., Downe, S. Discrimination against childbearing Romani women in maternity care in Europe: a mixed-methods systematic review. Reprod Health 14, 1 (2017). <u>https://doi.org/10.1186/s12978-016-0263-4</u> <u>https://reproductive-health-journal. biomedcentral.com/articles/10.1186/s12978-016-0263-4</u>

⁴² Zeitlin, J., Mortensen, L., Prunet, C. et al. Socioeconomic inequalities in stillbirth rates in Europe: measuring the gap using routine data from the Euro-Peristat Project. BMC Pregnancy Childbirth 16, 15 (2016). <u>https://doi.org/10.1186/s12884-016-0804-4</u>

One in five women in the EU has experienced physical and/or sexual violence in their lifetime from either a current or previous partner.^{43,44} EU Country-level studies report prevalence of domestic violence during pregnancy from 1.8% in France⁴⁵ to as high as 22% in Portugal.⁴⁶ Violence during pregnancy impacts the health of a woman and her baby, as well as how they interact with the healthcare system. A 2021 WHO report found that only 5% of countries in the WHO European Region had recognized the need for, and specified violence-related services for pregnant women.⁴⁷

Three: Research, Data, and Investment

- EU-wide initiatives, such as Eurostat, PERISTAT and REPROSTAT were developed in response to the need for sustainable and high-quality data collection, monitoring and evaluation across Member States. The PERISTAT indicator list includes core indicators, as well as further recommended indicators such as: foetal, neonatal, and child health; maternal health; population characteristics and risk factors; and health services. The REPROSTAT project was developed for the purposes of: identifying needs for improving sexual and reproductive health across the EU; supporting regular monitoring and evaluation of quality, effectiveness, and improvement made in reproductive health programmes within Europe; and facilitating comparison of reproductive health data both within and between EU Member States.⁴⁸ There is, however, broad variation in the ability to provide data on perinatal care across the EU.
- Sustainable Development Goal (SDG) 3 is to 'ensure healthy lives and promote well-being for all at all ages'. A maternal health-specific objective of SDG 3, to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030, illustrates the important role which good maternal health plays across a healthy life course. Progress towards this objective is measured via two indicators: 3.1.1. Maternal mortality ratio and 3.1.2 Proportion of births attended by a skilled birth attendant.⁴⁹
- Reductions in government healthcare spending were significantly associated with increased maternal mortality rates, which may occur for example through changes in the provision of skilled health professionals attending births.

Four: Policy in Europe

There are several policy frameworks which could be utilised to realise improved maternal health care.

Every Woman, Every Child (EWEC) was launched in 2010 to catalyse actions needed to implement the UN's Global Strategy for Women's, Children's and Adolescent's Health to address the health challenges which face women, children and adolescents.

⁴³ European Union Agency for Fundamental Rights (2014) Violence against women: an EU-wide survey. Results at a glance<u>https://</u> <u>fra.europa.eu/sites/default/files/fra-2014-vaw-survey-at-a-glance-oct14_en.pdf</u>

⁴⁴ Sardinha, L. et al. (2022) Global, regional, and national prevalence estimates of physical or sexual, or both, intimate partner violence against women in 2018. The Lancet. February 16, 2022 DOI: <u>https://doi.org/10.1016/S0140-6736(21)02664-7</u>

⁴⁵ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y

⁴⁶ Almeida FSJ, Coutinho EC, Duarte JC, Chaves CMB, Nelas PAB, Amaral OP, Parreira VC. Domestic violence in pregnancy: prevalence and characteristics of the pregnant woman. J Clin Nurs. 2017 Aug;26(15-16):2417-2425. doi: 10.1111/jocn.13756. <u>https://pubmed.ncbi.nlm.nih.gov/28178385/</u>

⁴⁷ WHO (2021) Addressing violence against women in health and multisectoral policies: a global status report. Geneva: World Health Organization; <u>https://apps.who.int/iris/bitstream/handle/10665/351470/9789240041257-eng.pdf?sequence=1</u>

⁴⁸ Temmerman M, Foster LB, Hannaford P, Cattaneo A, Olsen J, Bloemenkamp KW, Jahn A, da Silva MO. Reproductive health indicators in the European Union: The REPROSTAT project. Eur J Obstet Gynecol Reprod Biol. 2006 May 1;126(1):3-10. doi: 10.1016/j.ejogrb.2005.11.047 <u>https://pubmed.ncbi.nlm.nih.gov/16500743/</u>

⁴⁹ SDG Indicators Metadata Repository <u>https://unstats.un.org/sdgs/metadata/</u>

- ▲ At the 2016 World Health Assembly (WHA) a resolution was passed (WHA69.2) committing to implementation of the Global Strategy for Women's, Children's and Adolescent's Health (2016-2030), the objective of which is for the lives of every woman, child and adolescent worldwide to survive, thrive and transform.⁵⁰
- The Commission has used relevant directives to enforce standards of health care entitlements for EU migrants (Directive on Cross-border Healthcare), refugees (Qualification Directive) and asylum seekers (Reception Conditions Directive).
- Other important frameworks include the WHO Making Pregnancy Safer Framework and the WHO recommendations on antenatal care for a positive pregnancy experience.
- ▲ Although all Member States fulfil the minimum 4-month requirement set out in the parental leave directive (Directive 2010/18/EU), the overall duration of available leave differs considerably across the EU.

The EIWH Manifesto calls on the European Union to translate biological differences and social influences into regulatory and healthcare practice, requiring research data to be disaggregated by sex, age and social status and invest in a life-course approach to health promotion tackling inequalities in line with Articles 160/168 -Treaty on the Functioning of the European Union, the UN Sustainable Development Goals (SDGs) and the European Pillar of Social Rights.⁵¹ The Clinical Trials Regulation (536/2014) must be implemented in order to combat the systematic under representation of women in clinical trials, to improve the reporting of sex and gender in research findings, as well as to support translation of the knowledge from sex and gender research into regulatory and healthcare practice.

RECOMMENDATIONS

This evidence review has presented a breadth of information available on maternal health and maternal health care in the European Union. All women in Europe have a fundamental right to maternity care. However, there are large inequities that impact maternal morbidity and mortality. Drawing from this evidence base and analysis, a series of recommendations are now made to inform next steps and future activities.

Five types of actions have been identified to protect, promote, and advance maternal and infant health across Europe to develop and support effective, equitable and efficient policies and tools to support quality maternal care and safe pregnancies for all, which are vital for women and society as a whole. (See diagram on opposite page)/

- 1. Enact and Enforce: Existing EU legislation and policy tools must be utilised and strengthened.
- 2. Support and Promote: EU programme and practice must prioritise maternal and infant health and well-being
- 3. **Protect and Empower**: Access to services and education relating to maternal and infant health is vital for women and society as a whole
- 4. **Partner and Care**: Common standards of care, fostering education and collaboration of stakeholders across Europe
- 5. **Research and Engage**: Pioneering research, thorough data collection, and patient engagement is central to quality maternal health.

⁵⁰ WHO Committing to implementation of the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) <u>https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_14-en.pdf</u>

⁵¹ European Public Health Alliance (2019) Healthy Women - Healthy Europe https://epha.org/healthy-women-healthy-europe/

Within each of these five areas specific recommendations have been made, which are detailed in the tables below.

The incremental nature of policymaking processes and budgeting cycles are not in harmony with healthcare and societal needs. The EU and Member States must start take action to coordinate investment in maternal and infant health throughout all policies to ensure their health and wellbeing in Europe.

Stakeholders must work together to take these five types of actions to promote and advance maternal and infant health across Europe to develop and support effective, equitable and efficient policies and tools to support quality maternal care and safe pregnancies for all. It is possible to establish policy learning networks for exchange of national perspectives and work towards a common agenda for Europe.

A total of 25 recommendations are made across the 5 key actions. The table below outlines these in summary form, and more detailed tables outlining the recommended steps to achieve these goals can be found at the end of the full report.

Summary Table of Recommendations		
Action 1 Utilise & strengthen existing European Union legislation & policy tools to protect and improve maternal & infant health and wellbeing		
1	Support the Clinical Trials Regulation (536/2014) and improve data collection on medicine use during pregnancy and lactation.	
2	Enact and monitor the Work Life Balance Directive for Parents and Carers (2019).	
3	Revise the EU Maternity Leave Directive (92/85/EEC) and ensure that it is enforced.	
4	Gender equity measures, e.g. Extend the EU Gender Equality 2020-2030 to include maternal health and health care provision.	
5	Gender Equality Litigation - Investigate and address barriers to gender equality litigation in EU Member States.	
Action 2 Prioritise maternal and infant health and wellbeing throughout the EU in programme and practice		
6	Framing access to maternal health and women's autonomy under the umbrella of health as a human right.	
7	Prioritise maternal and infant health the European work programme and in national strategies.	
8	Promote a positive approach to maternal health and wellbeing, including encouraging healthy behaviours and reducing the risk of complications.	
9	Target programming that addresses chronic and infectious diseases, including supporting mental health, during pregnancy and lactation.	

Action 3 Enable access to services and education relating to maternal and infant health		
10	Improve access to treatment and care, guaranteeing that services for all pregnant women and children are accessible and affordable.	
11	Promote multilingual, open-source information on maternal and infant health topics and services in order to empower women and their families.	
12	Focus on accelerating the Health Literacy Agenda in Europe.	
13	Support an EU system on the safe use of medicines during pregnancy and lactation.	
14	Ensure that maternal and infant services and policies explicitly target vulnerable populations in their design and implementation.	
Action 4 Ensuring common standards of care and fostering education and collaboration of key stakeholders across Europe to promote maternal and infant health for all		
15	Connect maternal care, public-patient involvement, and implementation science.	
16	Advocate for and implement European standards of maternal care.	
17	Improve health and social professional education on maternal health.	
18	Support the creation of a multi-stakeholder network on maternal health, wellbeing, and combating obesity.	
19	Employ holistic approaches to maternal and infant health, incorporating multidisciplinary, multi-sectoral and "uncommon" stakeholders. Engage the community in programming.	
Action 5 Pioneering research, thorough data collection and patient engagement, underpins guality maternal health		
20	Research the maternal health system in Europe through a systems-thinking lens.	
21	Ensure that data is sex, gender and age-disaggregated. Support cross-national data and research on maternal and infant health. Collect more representative and better-quality data.	
22	Evaluate the state of play of maternal health through an European Parliament commissioned study on maternal health and safety in the EU.	
23	Explicitly fund health research on maternal and infant health, including biological, social and economic factors.	
24	Support Member States in the exchange of best practice for maternal health policy and programming through policy networks.	
25	Increase women and their families' involvement in maternal care and programming.	

European Institute of Women's Health Maternal Health in the European Union

INTRODUCTION

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period. The health of women pre-, during and post-pregnancy reflects a broader continuum of healthy life, as well as the socio-demographic and economic context. The provision of maternal and child health care is an opportunity both to improve maternal and child health outcomes and to promote healthy lives more generally.

To improve maternal health, it is important to regularly examine available information on trends, variations and inequalities on maternal health across the European Union (EU) as a whole and within and between Member States. Such examinations provide an opportunity to identify and explain both similarities and variations in health and care at the EU-level, and to learn from countries who are noted with regards to standards of care. Maternal health and related outcomes can be a litmus test for the strength of health systems. Therefore, such reviews offer insight regarding the performance of health systems to provide appropriate and quality care more broadly.

In comparison to high-income countries outside the EU, there has been strong progress on indicators of maternal health and care at the EU-level. Nevertheless, there is a need to dig deeper into the evidence on maternal health across the EU in a manner that reflects the multitude of factors which support maternal health. Currently, many tools and indicators used to assess maternal health care performance in Europe have concentrated on measures of adverse health, medical outcomes and interventions. To account for the complexity of measuring maternal health in an evidence-based manner. Maternal health is increasingly situated in relation to the promotion of positive birth experiences, and the provision of high quality and women-centred care. Therefore, this report will reflect the increased need for evidence reviews to align with the concept of maternal health and care as viewed beyond mortality and morbidity.'

Ultimately, every woman has a fundamental right to health, which high quality maternity care should support. The realisation of rights related to maternal health and quality maternal care are multi-faceted, and standards and experiences of maternal health and care vary across the EU. Access to maternal health in the EU is affected by the interplay of factors such as health systems, law, policies, socioeconomic factors and attitudes of health professionals and users, among others. Several factors can increase the risk of adverse health outcomes for women and their children, in particular for vulnerable women such as migrants, included but not limited to socioeconomic situation, poverty, nationality, ethnicity, distance from appropriate healthcare, and inadequate provision of information and services. Furthermore, the rise in non-communicable disease in the EU, such as mental health conditions, cardiovascular diseases and diabetes, present increased risk factors for poor maternal and child health outcomes. Evidence informed policy responses can ensure that rights are fully and equitably realised in practice for all women in the EU.

Reflecting the role of maternal health in the continuum of the healthy lives of women, evidence and definitions used in this report will relate to the health of a woman before, during and after pregnancy and situate pregnancy in the context of broader health and life. The report will present an opportunity to take stock of the current status of maternal health across the EU in a manner which centres women and their experiences at the heart of the conversation on maternal health. This approach acknowledges the complexity of factors related to positive health and care outcomes. The report reviews evidence on the maternal healthcare journey including public health, health promotion and disease prevention; access to care and information; labour and delivery; health condition management and safe use of medication. Reviewed evidence also includes the maternal health context: socio-economic support around the time of birth; disparities and vulnerable populations; research, data and investment; and policy in Europe.

Understanding trends and disparities across the EU will further the knowledge base for maternal health and care. It will support dialogue and action amongst key stakeholders across the EU and Member States to improve maternal health and care outcomes, further realising the right to safe pregnancies for women and to support a healthy life-course approach to maternal health in the EU.

Aims and Objectives

The overall aim of this report is to trace trends and disparities in maternal health and well-being, provision of maternal health care, services and health outcomes, to assess key issues as well as inequalities in maternal health in the EU.

The specific objectives are:

- 1. To summarise available evidence, including statistical data on maternal health, maternal mortality, and access to care
- 2. To map the evidence on prevention strategies to guard against risks to maternal health
- 3. To identify barriers which prevent access to quality maternal health services at all levels

DEFINING MATERNAL HEALTH

Maternal health, as defined by the World Health Organization (WHO), encompasses the health of women during pregnancy, childbirth and the postpartum period, linking directly to broader aspects of health that precede and underpin maternal health, including general health and family planning.⁵² Therefore, care is needed in advance of pregnancy; during pregnancy; and before, during and after childbirth. Across the maternal care pathway, health issues to be addressed range from risk detection and management; access to sexual and reproductive health services; nutrition; screening and management of communicable and non-communicable diseases; prevention of gender-based violence; and the experience of pregnancy and childbirth in the context of broader social and economic life.⁵³

This report adopts a wide perspective, as supported by the WHO definition above, which focuses on the health of a woman before, during and after pregnancy, but also situates the pregnancy in the context of her broader health and life, including socio-economic situation. The evidence and definitions in this report reflect the wider perspective, extending the analysis to (in)fertility and to infants' probability of developing chronic conditions by virtue of their mothers' access to and quality of care during pregnancy. According to the WHO, each element of care around pregnancy should ensure that women and their babies reach their full potential for health and well-being.

⁵² World Health Organization. (D2015)D. Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals. World Health Organization. https://apps.who.int/iris/handle/10665/200009

⁵³ WHO Fact sheets on sustainable development goals: health targets: Maternal health <u>https://www.euro.who.int/__data/assets/</u> pdf_file/0006/354921/3.1-SDG-Fact-sheet-Maternal-Health.pdf

Simply surviving pregnancy and childbirth can never be the marker of successful maternal health care: reducing maternal injury and disability needs to be expanded to promote full health and well-being. In addition to preventing morbidity and mortality, we also have to focus on thriving and quality of care - respect, women centred, and community led care which meets women where they are at. Whilst not losing sight of the evident need to address morbidity and mortality and to protect particularly at-risk populations, we must open up dialogue towards a person-centred approach that empowers women through a healthy life course approach. Addressing inequalities that affect health outcomes is essential to ensuring that all women have access to respectful and high-quality maternity care.

FACTS AND FIGURES

This section reviews the available data and analyses trends in maternal health and care across the EU including the extent of maternal morbidity and mortality, health-seeking experiences, and provision of care, amongst other areas.

Key data is available on how many women are pregnant each year in the EU, as a percentage of its total population, as well as data on access to care during the early weeks of pregnancy; the number of preventable deaths; and exposure to medications during pregnancy. Data is also available on trends related to fertility, age range of pregnant women, number of children, and rates of miscarriage.

Between 2000 and 2015 within the European Region, the maternal mortality rate (MMR) decreased by almost half from 33 to 16 deaths per 100 000 live births respectively. Despite this decrease, the highest national maternal mortality rate in the region is estimated to be the 25th lowest globally. Disparities within the European population also exist: **women categorised as having "non-western" origin are at a 60% higher rate of maternal mortality.**⁵⁴

Perinatal mortality is defined by the WHO as weight specific foetal deaths (\geq 1000 g) and early neonatal deaths per 1000 births (live births and stillbirths). The perinatal mortality ratio differs significantly between countries, and the ratio is approximately 35 times higher in some countries in the European Region. However, the perinatal mortality rate has decreased from 9.5 per 1000 live births in 2000, to fewer than 7.4 in 2013. However, several countries in the European Region do not report following this definition, therefore official data may underestimate the full scale of the problem. Specific reports prove that correct reporting of maternal deaths is still not in place in several countries.⁵⁵

Trends across the EU

There are on average 1.53 live births per woman in the EU, ranging from 1.14 in Malta, to 1.86 in France.⁵⁶ The average age of a woman at birth of first child in the EU was 29.7 in 2021.⁵⁷ Regarding

⁵⁴ WHO Maternal and Newborn Health Data and Statistics <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/data-and-statistics</u>

⁵⁵ WHO Maternal and Newborn Health Data and Statistics <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/data-and-statistics</u>

⁵⁶ EUROSTAT Fertility Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> (accessed 17.11.2023)

⁵⁷ EUROSTAT Fertility Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> (accessed 17.11.2023)

later in life pregnancies,⁵⁸ the percentage of mothers aged 35 years or older is increasing across the EU. The median percentage of women having babies at age 35 or older was 20.8%, a trend which exceeded 29% of mothers in Portugal, Greece, Ireland, Italy and Spain and less than 15% of mothers in Bulgaria, Romania and Poland. The lowest fertility rates are found in Malta and other Mediterranean countries such as Spain, Italy, Cyprus, Greece, and Portugal.⁵⁹ These trends tend to relate to specific constellations of labour market and social policies that shape the circumstances in which women give birth.⁶⁰

The European Perinatal Health Report provides indicators on perinatal health and care from routine statistical data in 25 EU Member States, capturing core indicators across time⁶¹ on the characteristics of women within reproductive age ranges; mode of delivery; mothers' mortality associated with child-bearing; and babies' health - mortality and morbidity during pregnancy and in the first year of life. Sourced from the EU Health Programme for Health Surveillance and Reporting, the data maps how maternal and infant mortality have reached historic lows. Nevertheless, pregnancy and delivery still represent risks. Stillbirth rates have decreased to a lesser extent than neonatal and infant mortality, but their causes remain largely unknown. Most maternal deaths are caused by substandard care. Preterm birth and low birthweight have maintained a stable, if slightly increasing, proportion of all births. A crucial time of high risk is during birth and in the first month of the baby's life. Specific reports prove that correct reporting of maternal deaths is still not in place in several countries. Variations between countries reflect variations in data sources and collection strategies, including details on sepsis, abortion and ectopic pregnancy, anaesthesia, among others. There is also evidence of an increased risk of maternal death among older mothers and for caesarean section by comparison to other modes of delivery.⁶² The three most prevalent causes of maternal death identified were embolism, hypertensive disease of pregnancy; and haemorrhage.

Birth Rates

Up to January 2020, of a total EU population of 448 million, over five million women were pregnant each year. In 2019, 4.2 million babies were born in the EU. This number increased slightly in 2021 to 4.09 million.⁶³ **A 2019 study cites that just under 5% of births in the EU take place in the women's home**. One notable exception is the Netherlands, where 15% of births took place in the woman's home.⁶⁴ Most countries have experienced declining or stable rates of caesarean sections as a proportion of total births. While EU countries have amongst the lowest rates of caesarean section across higher income countries, some countries such as Bulgaria, Cyprus, Poland, Romania, report "*worrying increases*".⁶⁵ **Rates of stillbirth, and neonatal and infant death, are lower for**

⁵⁸ EUROPEAN PERINATAL HEALTH REPORT: Core indicators of the health and care of pregnant women and babies in Europe in 2015 <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

⁵⁹ McCarthaigh, Sean. 2019. "Ireland's fertility rate one of highest in EU," *Irish Examiner.* https://www.irishexaminer.com/news/arid-30910812.html.

⁶⁰ OECD Labour Market and Social Policy Occasional Papers Low Fertility and Labour Force Participation of Italian Women <u>https://www.oecd-ilibrary.org/social-issues-migration-health/low-fertility-and-labour-force-participation-of-italianwomen_263482758546</u>

⁶¹ Zeitlin J1, Mohangoo AD, Delnord M, Cuttini M; EURO-PERISTAT Scientific Committee, 2013, "The second European Perinatal Health Report: documenting changes over 6 years in the health of mothers and babies in Europe," J Epidemiol Community Health, 67(12): 983-985. doi: 10.1136/jech-2013-203291.

⁶² Alexander S, Wildman K, Zhang W, Langer M, Vutuc C, Lindmark G. Maternal health outcomes in Europe. Eur J Obstet Gynecol Reprod Biol. 2003 Nov 28;111 Suppl 1:S78-87. doi: 10.1016/j.ejogrb.2003.09.008. PMID: 14642322.

⁶³ EUROSTAT Fertility Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> (accessed 17.11.2023)

⁶⁴ Access to maternal care and midwifery services for vulnerable populations. EU 2019 https://www.europarl.europa.eu/RegData/ etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf

⁶⁵ EUROPEAN PERINATAL HEALTH REPORT Core indicators of the health and care of pregnant women and babies in Europe in 2015 <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

babies in the EU than in other parts of the world, however the decline in rates of stillbirth and neonatal/infant death has been uneven and slower than "in previous periods". Preterm birth and low birthweight rates have remained stable over time.⁶⁶ Regarding access to care, an estimated 500,000 or 1/10 women in the EU do not have access to health services in their first months of pregnancy.⁶⁷ Two thirds of new-born deaths could be prevented with appropriate care. Within one study of 37,000 women from Italy, social inequities including for vulnerable populations, are evident in that early use of prenatal care services is negatively impacted by low socioeconomic status, low educational attainment, immigrant status, young maternal age, cultural factors, lone parent status and unemployment.⁶⁸

Infant Mortality

One of the most significant changes that has led to increases in life expectancy at birth has been the decrease in infant mortality rates. Between 2008 and 2018, the infant mortality rate in the EU-27 fell from 4.2 deaths per 1 000 live births to 3.4 deaths per 1 000 live births, dropping further to 3.2 in 2021. Extending the analysis to the last 20 years, the infant mortality rate was almost halved (6.6 deaths per 1 000 in 1998). Most significant reductions in infant mortality were generally recorded within those EU Member States which tended to record higher levels of infant mortality in earlier years, compared with the EU average.

Nevertheless, around 14,600 children died before reaching one year of age in the EU-27 in 2018; equivalent to an infant mortality rate of 3.4 deaths per 1 000 live births.⁶⁹ That year, the highest infant mortality rates in the EU-27 were registered in Romania (6.0 deaths per 1 000 live births) and Bulgaria (5.8 deaths per 1 000 live births), and the lowest were recorded in Estonia (1.6 deaths per 1 000 live births) and Slovenia (1.7 deaths per 1 000 live births). The OECD Health at a Glance⁷⁰ records trends on infant health, with infant mortality reflecting the effect of socioeconomic conditions on the health of mothers and newborns, as well as the effectiveness of health systems, particularly in addressing any life-threatening problem during the neonatal period (i.e., during the first four weeks).

CONCEPTUALISING MATERNAL HEALTH

There has been recent global recognition of a paradigm shift in the maternal health agenda from preventing maternal deaths to promoting women's health and wellness, given the links between chronic conditions, morbidity in pregnancy, and long-term health.⁷¹ In this paradigm, pregnancy is viewed as a window of opportunity into the current and future health of women, offering a critical entry point for women who may otherwise not seek or have access to care for chronic conditions. Maternal health services should move beyond the focus on emergency obstetric care,

⁶⁶ EUROPEAN PERINATAL HEALTH REPORT Core indicators of the health and care of pregnant women and babies in Europe in 2015 <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

⁶⁷ WPL (2018) Improving Maternal Healthcare for Vulnerable Women in EU28. What can you do? Women Political Leaders Global Forum, p.13./ o <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁶⁸ Chiavarini, M, Lanari, D, Minelli, L. and Salmasi, L. (2014) Socio-demographic determinants and access to prenatal care in Italy, BMC Health Services Research 14:174. <u>https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-14-174</u>

⁶⁹ EUROSTAT Mortality and Life Expectancy Statistics <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Mortality</u> and life expectancy statistics#Infant_mortality. (accessed 17.11.2023)

OECD Health at a Glance Europe <u>https://www.oecd-ilibrary.org/docserver/health_glance_eur-2018-en.pdf?expires=1619731644&id=id&accname=guest&checksum=88A52DB9E8DB38FA25CF4AA1051D7886</u>

⁷² Firoz, T., McCaw-Binns, A., Filippi, V., Magee, L.A., Costa, M.L., Cecatti, J.G., Barreix, M., Adanu, R., Chou, D., Say, L. and (2018), A framework for healthcare interventions to address maternal morbidity. Int J Gynecol Obstet, 141: 61-68. <u>https://doi.org/10.1002/ ijgo.12469</u>

to a broader approach that encompasses preventive and early interventions, integrated within existing services. These authors contend that health systems need to respond by prioritizing funding for developing integrated health programs, and workforce strengthening. **The changing landscape of maternal health calls for an expansion of the narrow focus of maternal health, to a framework for healthcare interventions that addresses maternal morbidity, beyond surviving to thriving**. This perspective is also advocated in the Lancet:⁷² maternal health services are dependent on the entire health system, and maternal mortality cannot be lowered in isolation. A broader approach towards maternal health should be pursued in which safe motherhood interventions become an entry point for an overall improvement of service quality. **Lastly, a Person-Centred Care Framework for Reproductive Health Equity delineates three levels of interdependent** contexts for women's reproductive health: societal and community determinants of health equity, women's health-seeking behaviours, and the quality of care within the walls of the facility.⁷³

The Sustainable Development Goals have set health-related targets for mothers, newborns, and children under the umbrella of Universal Health Coverage by 2030. Addressing quality of care is seen as fundamental to reducing maternal and newborn mortality and to achieving the health-related SDG targets. In this context, the WHO has articulated a global vision where 'every pregnant woman and newborn receives quality care throughout pregnancy, childbirth and the postnatal period under the umbrella of Universal Health Coverage and quality.' The vision is in alignment with two complementary global action agendas 'Strategies toward Ending Preventable Maternal Mortality (EPMM)' and the 'Every Newborn Action Plan (ENAP)'. Furthermore, the WHO has conceptualised a framework for improving the quality of care for mothers and newborns around the time of childbirth, encompassing both the provision and experience of care. Within this framework and in line with the Organization's mandate, six strategic areas have been identified as a basis for a systematic, evidence-based approach to providing guidance for improving the quality of maternal and newborn care. These are: clinical guidelines, standards of care, effective interventions, quality measures, and relevant research, and capacity building.

⁷³ Sudhinaraset M, Afulani P, Diamond-Smith N, Bhattacharyya S, Donnay F, Montagu D. Advancing a conceptual model to improve maternal health quality: The Person-Centered Care Framework for Reproductive Health Equity. Gates Open Res. 2017 Nov 6;1:1. doi: 10.12688/gatesopenres.12756.1. PMID: 29355215; PMCID: PMC5764229./ Alex Ergo, Rena Eichler, Marge Koblinsky and Nirali Shah. Strengthening Health Systems to Improve Maternal, Neonatal and Child Health Outcomes: A Framework. Washington, D.C., May 2011 <u>https://www.mchip.net/sites/default/files/HSS%20and%20MNCH%20Framework_final.pdf</u>

⁷² A. Jahn and O. Razum. Measurement of maternal health. The Lancet 2002 Vol. 360 Issue 9336 Pages 876 DOI: 10.1016/S0140-6736(02)09981-6https://doi.org/10.1016/S0140-6736(02)09981-6

Section One: The Maternal Healthcare Journey

ONE: PUBLIC HEALTH, HEALTH PROMOTION AND DISEASE PREVENTION

The WHO defines disease prevention as "specific, population-based and individual-based interventions for primary and secondary (early detection) prevention, aiming to minimize the burden of disease and associated risk factors."⁷⁴ Interventions can be both primary and secondary: primary intervention relates to avoiding the manifestation of a disease, with secondary intervention related to early detection. Components of health promotion and disease prevention are interrelated and cannot all be considered in isolation, as targeted improvements in one area of health may reduce risks of another. As an example, obesity is associated with gestational diabetes mellitus (GDM): **Obesity during pregnancy is a risk factor for adverse pregnancy outcomes,** and is associated with negative long-term health outcomes for both mothers and offspring, aggravated by the high incidence of abnormal glucose tolerance and excessive gestational weight gain found in this group."⁷⁵

Much work on early detection and promotion relates to the paradigm shift - from preventing maternal deaths to promoting women's health and wellness - which was earlier set out.⁷⁶ This window of opportunity can extend to the health of the family. There is evidence that promoting the healthy development of their infant can encourage and reinforce change amongst pregnant women.^{77,78} More broadly, it can also provide an intervention point identifying any risk of experience of domestic violence including intimate partner violence. Furthermore, adaptive health promotion is based on the evolving needs of women: "The increase in almost all countries of risk factors regarding perinatal health, such as a more advanced age at childbirth, and Body Mass Index (BMI), requires healthcare services to adapt to the evolving needs of mothers and children."⁷⁹Specific to maternal health, primary prevention services and activities include vaccination, provision of information on behaviour and medicinal health risks; good nutrition and food; dental hygiene and oral health. Secondary prevention relates to screening for early detection of risks; maternal and child health programmes; and chemo-prophylactic agents to control risk factors such as hypertension.

Measures for early detection of health problems and prevention of ill-health are important aspects of health and well-being for women and their families. From an economic perspective, early detection and prevention are also cost saving, as they reduce costs associated with provision of care to address ill-health. Nevertheless, although health promotion and early detection effectively utilise limited healthcare resources, only 3% of health budgets are spent on prevention.⁸⁰ There is merit in diverting more resources into early detection and prevention,

⁷⁴ WHO. Health promotion and disease prevention through population-based interventions, including action to address social determinants and health inequity. <u>http://www.emro.who.int/about-who/public-health-functions/health-promotion-diseaseprevention.html</u>

⁷⁵ Maternal Obesity in Europe, where do we stand and how do we move forward? (2016) Journal of Obstetrics & Gynaecology and Reproductive Health, <u>https://www.sciencedirect.com/science/article/abs/pii/S0301211516301518</u>

⁷⁶ Firoz, T., McCaw-Binns, A., Filippi, V., Magee, L.A., Costa, M.L., Cecatti, J.G., Barreix, M., Adanu, R., Chou, D., Say, L. and (2018), A framework for healthcare interventions to address maternal morbidity. Int J Gynecol Obstet, 141: 61-68. <u>https://doi.org/10.1002/ ijgo.12469</u>

⁷⁷ Anderson, Annie S. «Pregnancy as a time for dietary change?.» *Proceedings of the nutrition society* 60.4 (2001): 497-504.

⁷⁸ Hall M, Macintyre S & Porter M (1985) Antenatal Care Assessed: A Case Study of Innovation in Aberdeen. Aberdeen: Aberdeen University Press.

⁷⁹ European Perinatal Health Report 2015: https://www.europeristat.com/index.php/reports/european-perinatal-health-report-2015. html

⁸⁰ EuroHealthNet. 2015. *What do EU Member States need from the EU health policy*? https://eurohealthnet.eu/sites/eurohealthnet. eu/files/2015_04_17_Letter%20for%20informal%20EPSCO%20Council_final.pdf [Accessed 01.09 2018].

both to promote good health and well-being generally, and to reduce costs associated with the provision of care.

The subsequent sections cover health promotion and disease prevention in relation to vaccination, smoking, alcohol consumption, BMI, exercise, nutrition, and fertility, followed by approaches to addressing health promotion and disease prevention, that is, screening and behaviour change.

Vaccination

As pregnant women are classified as a vulnerable population group, it is considered important for pregnant women to have up-to-date immunisation schedules, ideally before becoming pregnant, as these protect the health of both mother and child. During pregnancy, a woman's immune system is altered and women face elevated risk of contracting infectious diseases. In addition, the foetus is particularly vulnerable to some vaccine-preventable infections.⁸¹ Vaccines prevent pregnant women from contracting diseases such as **measles, mumps and rubella**, through the passing of protective antibodies to the infant in utero - referred to as "passive immunity"⁸² - primarily during the third trimester. Health professionals are required to verify the immunity of pregnant women.⁸³ Antibodies from the mother persist in newborns for three to four weeks and then decline over the subsequent six to twelve months. As antibodies to help combat disease.⁸⁴

The measles, mumps and rubella (MMR) vaccine is recommended for women prior to pregnancy. Rubella can cause miscarriage and stillbirth. Rubella can also cause Congenital Rubella Syndrome in nine out of ten babies, which can result in birth defects such as blindness, brain damage, deafness, or heart disease. As the MMR vaccine is a live vaccine, women must be given it at least one month before becoming pregnant.⁸⁵ The period after delivery and before discharge from hospital offers an opportunity to vaccinate women for their own protection and for the protection of their infants, including the pertussis and MMR vaccines.^{86,87} As during pregnancy, routine inactive vaccines appear to be safe to administer during breastfeeding. However, if the mother is breastfeeding, active vaccines are not recommended as they may be passed on through the milk to the infant.^{88,89}

Nevertheless, research on the safety of immunisation in pregnant and breastfeeding women remains limited. Studies have shown that inactivated vaccines against tetanus toxoid and polio are effective and safe during pregnancy. **However, active vaccines are generally not recommended to pregnant women due to concerns that they could affect the foetus; women are advised not to receive active vaccines less than twenty-eight days before becoming pregnant.**^{90,91}

⁸¹ Public Health Agency of Canada. 2013. *Canadian Immunisation Guide*. "Part 3: Vaccination of Specific Populations." http://www.phac-aspc.gc.ca/publicat/cig-gci/p03-04-eng.php.

⁸² NHS. 2012. *How vaccines work*.

⁸³ HSE. 2020. Vaccines & Pregnancy. https://www.hse.ie/eng/health/immunisation/pubinfo/pregvaccs/.

⁸⁴ Public Health Agency of Canada. 2013. *Canadian Immunisation Guide*.

⁸⁵ HSE. 2020. Vaccines & Pregnancy. https://www.hse.ie/eng/health/immunisation/pubinfo/pregvaccs/.

⁸⁶ Public Health Agency of Canada. 2013. *Canadian Immunisation Guide*.

⁸⁷ New York Department of Health. 2013. *Vaccinating women of reproductive age recommendations and guidelines*. http://www. health.ny.gov/prevention/immunisation/vaccinating_women_of_reproductive_age_guidelines.htm.

⁸⁸ Public Health Agency of Canada. 2013. *Canadian Immunisation Guide*.

⁸⁹ New York Department of Health. 2013. Vaccinating women of reproductive age recommendations and guidelines. http://www. health.ny.gov/prevention/immunisation/vaccinating_women_of_reproductive_age_guidelines.htm.

⁹⁰ Public Health Agency of Canada. 2013. *Canadian Immunisation Guide*.

⁹¹ Mayo Clinic. 2013. Vaccines during pregnancy: are they safe? http://www.mayoclinic.org/vaccines-during-pregnancy/expertanswers/FAQ-20057799.

There is very little evidence for and against vaccination for pregnant women during the flu season, and there is a need to collect more evidence to support decision-making for women during pregnancy. The European Centre of Disease Prevention and Control (ECDC), reviewing vaccination of pregnant women, reviewed the evidence for and against influenza vaccination of all women who are pregnant during the periods of influenza circulation, regardless of the pregnancy trimester and the presence of comorbidities. It found little evidence in the literature, drawing instead on expert input. Recommendations included the establishment of databases on the efficacy of vaccines on pregnant women in Europe.⁹² The European Health Information Gateway details rates of influenza coverage for pregnant women across the EU according to country, where coverage is measured as the percentage of persons in risk groups who received one dose of influenza vaccine during the influenza season. There are disparities in the data collected according to whether all women are vaccinated, or only a certain trimester (e.g., Germany), whether women are healthy or with chronic conditions, or whether no seasonal flu vaccine is recommended, or there is no national vaccination programme. Higher rates of vaccination and coverage are recorded in the UK and Republic of Ireland, followed by Spain. Rates in other countries are substantially lower, with several central European countries, for example, Belgium and France, not recording data on vaccination coverage.⁹³ Coverage here is measured as the percentage of persons in risk groups who received one dose of influenza vaccine during the influenza season, and target (risk) groups for influenza vaccination are defined as all pregnant women regardless of trimester and health status (includes healthy pregnant women and those with chronic conditions), pregnant women in the 2nd and 3rd trimester (includes healthy pregnant women and those with chronic conditions), and only pregnant women with chronic conditions (regardless of trimester).

Despite the dearth of evidence, **some national health services such as that in the United Kingdom (UK) recommend that women receive both the flu and pertussis vaccines and that all pregnant women have the flu vaccine at any stage of pregnancy.**⁹⁴ Flu can result in elevated risk for serious respiratory illness and complications during pregnancy for the mother. It can also cause risks to the infant, including premature birth and small babies. Women's immunity to pertussis (whooping cough) wanes during pregnancy. As a result, pregnant women should be vaccinated between 16 and 36 weeks of pregnancy, which protects both mother and child.⁹⁵

On the question of mandatory vaccination and whether it works in Europe, the picture is mixed and the diversity of approaches suggests that no proven strategy exists that can be universally applied.⁹⁶ A 2010 study of 27 EU countries (plus Iceland and Norway),⁹⁷ found that 15 countries had no mandatory vaccines. In the meantime, Italy has added 10 vaccines to its list of compulsory vaccines; France and Romania are preparing new laws that would penalise parents of unvaccinated children; and Finland introduced legislation in March 2018 that requires health and social care providers to ensure staff are immunised against measles, varicella, pertussis and

newborn-health/maternal-and-newborn-health [Accessed 13 May 2020].

⁹² ECDC scientific advice on seasonal influenza vaccination of children and pregnant women <u>https://www.ecdc.europa.eu/sites/portal/files/media/en/publications/Publications/Seasonal%20influenza%20vaccination%20of%20children%20and%20 pregnant%20women.pdf</u>

⁹³ WHO Influenza Vaccination Coverage, Pregnant Women <u>https://gateway.euro.who.int/en/indicators/infl_9-influenza-vaccination-coverage-pregnant-women/</u>

 ⁹⁴ NHS. 2012. The flu jab in pregnancy. http://www.nhs.uk/Conditions/pregnancy-and-baby/Pages/flu-jab-vaccine-pregnant.aspx
⁹⁵ WHO Europe. 2020. Maternal and Newborn Health. http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-

⁹⁶ Mandatory Vaccination: Does It Work In Europe? 2017 <u>https://www.vaccinestoday.eu/stories/mandatory-vaccination-work-europe/comment-page-1/</u>

⁹⁷ Haverkate M, D'Ancona F, Giambi C, Johansen K, Lopalco PL, Cozza V, Appelgren E; VENICE project gatekeepers and contact points. Mandatory and recommended vaccination in the EU, Iceland and Norway: results of the VENICE 2010 survey on the ways of implementing national vaccination programmes. Euro Surveill. 2012 May 31;17(22):20183. doi: 10.2807/ese.17.22.20183-en. PMID: 22687916.

influenza. Overall, substantial disparities exist across countries in approaches to delivering and recording vaccination.⁹⁸

Trends also transpire across time, and relate to policy change: in response to a national outbreak in 2012, with 14 deaths among 429 infant cases infected with pertussis, the UK was the first country in Europe to initiate a maternal vaccination programme.⁹⁹ Pointing to the challenges of data collection on vaccination, a 2011 study into differences in pandemic influenza vaccination policies for pregnant women in Europe,¹⁰⁰ which included data from 24 out of 32 European countries of which 20 had an official pandemic vaccination policy targeting pregnant women, mapped that among four countries without official pandemic vaccination policies, two included some vaccination of pregnant women. In 12 out of 20 countries the policy was to vaccinate only second and third trimester pregnant women and in 8 out of 20 countries the policy was to vaccinate pregnant women, of which four contained adjuvants. Few countries had mechanisms to monitor the number of vaccinations given specifically to pregnant women over time and vaccination uptake varied.

Health professionals play an important role in vaccination uptake in pregnant women. Many women worry about safety, therefore GP and other health professional advice during pregnancy is vital for vaccine uptake.¹⁰¹ Studies have found low uptake of vaccines during pregnancy—in a German study only 23% of pregnant women were vaccinated against the flu. Confidence and knowledge are major barriers to vaccination uptake.¹⁰² Gynaecologists, GPs, midwives and other health professionals have been shown to help with vaccine uptake in pregnant women.¹⁰³ **Many mothers, particularly first-time mothers, have vaccine hesitancy and feel that they do not have enough information about infectious diseases as well as vaccination.^{104,105} The success of the implementation of a maternal pertussis vaccination in several European countries with a vaccine originally developed for infant immunization and with limited data of its use in pregnant women highlights the importance of immunization policies and their active follow-up to fully benefit from new vaccines.**

Smoking

According to the WHO, about 1 in 10 women in the European region smoke during pregnancy.¹⁰⁶ In a 2010 report, based on perinatal health data, trends across EU Member States were identified

⁹⁸ WHO Europe. 2020. Maternal and Newborn Health. http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health [Accessed 13 May 2020].

⁹⁹ The European Files (2019) Maternal vaccination: A new and highly effective policy to improve European pertussis immunisation programmes 2019. <u>https://www.europeanfiles.eu/health/maternal-vaccination-a-new-and-highly-effective-policy-to-improveeuropean-pertussis-immunisation-programmes</u>

¹⁰⁰ Luteijn, J. M., Dolk, H., & Marnoch, G. J. (2011). Differences in pandemic influenza vaccination policies for pregnant women in Europe. BMC public health, 11, 819. https://doi.org/10.1186/1471-2458-11-819

¹⁰¹ Hallissey, R., O'Connell, A., & Warren, M. (2018). Factors that influence uptake of vaccination in pregnancy.

¹⁰² Bödeker, Birte, et al. "Cross-sectional study on factors associated with influenza vaccine uptake and pertussis vaccination status among pregnant women in Germany." *Vaccine* 32.33 (2014): 4131-4139.

¹⁰³ Bödeker, Birte, et al. "Cross-sectional study on factors associated with influenza vaccine uptake and pertussis vaccination status among pregnant women in Germany." *Vaccine* 32.33 (2014): 4131-4139.

¹⁰⁴ Danchin, Margie H., et al. "Vaccine decision-making begins in pregnancy: Correlation between vaccine concerns, intentions and maternal vaccination with subsequent childhood vaccine uptake." *Vaccine* 36.44 (2018): 6473-6479.

¹⁰⁵ Yuen, Carol Yuet Sheung, and Marie Tarrant. "Determinants of uptake of influenza vaccination among pregnant women-a systematic review." *Vaccine* 32.36 (2014): 4602-4613.

WHO More than 1 woman in 10 smoke during pregnancy in many countries in the Region <u>https://www.euro.who.int/en/health-topics/disease-prevention/tobacco/news/news/2013/07/more-than-1-woman-in-10-smoke-during-pregnancy-in-many-countries-in-the-region</u>

with smoking during pregnancy or in the last trimester varying from under 5% in Lithuania and Sweden to 14% in Catalonia in Spain, 15% in Northern Ireland, 16% in Wales, 17% in France, and 19% in Scotland.¹⁰⁷

Between 11% and 30% of pregnant women either smoke or are passively exposed to tobacco smoke. A systematic review and meta-analysis of national, regional, and global prevalence of smoking during pregnancy in the general population, published in The Lancet,¹⁰⁸ estimated the global prevalence of smoking during pregnancy to be 1.7% (95% CI 0.0-4.5), with the highest prevalence in the European Region. **The Republic of Ireland had the highest estimated prevalence of smoking during pregnancy globally** (38.4%, 95% CI 25.4-52.4), followed by Uruguay (29.7%, 16.6-44.8), then Bulgaria (29.4%, 26.6-32). Thus, two European countries are within the top three. Furthermore, the proportion of women who smoked daily and continued to smoke daily during pregnancy was 52.9% (95% CI 45.6-60.3), ranging from 30.6% (95% CI 25.6-36.4) in the European Region to 79.6% (44.2-100.0) in the Western Pacific Region. **Smoking during pregnancy evidently remains a prevalent behaviour in many countries.** However, progress in reducing rates has been made, with a 13% reduction in the percentage of women in the EU smoking during pregnancy between 2010 and 2015.¹⁰⁹

In a quarter of the 19 countries able to report data on smoking during pregnancy, more than 12.5% of women smoked, with percentages highest in Valencia in Spain (18.3%), Wales (17.3%), France (16.3%), and Northern Ireland (14.3%), the latter in contrast to the rate for the Republic of Ireland, above. In contrast, fewer than 5% of women smoked during pregnancy in Norway, Sweden and Lithuania.¹¹⁰

There are particular demographic and socio-economic features associated with smoking. In a cross-sectional study of the prevalence and determinants of smoking before and during pregnancy among new mothers and pregnant women in 15 European countries found that women with fewer resources living in Western or Eastern Europe were more likely not only to smoke before pregnancy but also to continue smoking during pregnancy. The findings indicate that a **focus on smoking cessation is important in antenatal care in Europe as many women smoke before pregnancy, and still continue to do so in pregnancy.**¹¹¹

Smoking impacts both maternal and foetal health as nicotine and carbon monoxide reduces foetal oxygen supply. In addition, nicotine increases foetal blood pressure. Due to transport through the placenta, nicotine and carbon monoxide levels found in the foetus are significantly higher than those found in the mother. Women who smoke during pregnancy are at elevated risk of having a stillbirth, perinatal mortality, ectopic pregnancy, placental abruption (placenta detachment from uterine wall before delivery), placenta previa (placenta covering of the uterine opening) and premature labour. Smoking is estimated to account for 15% of all premature labours. Infants

¹⁰⁷ Euro Peristat Proportion Of Women Smoking During Pregnancy In European Countries In 2010 <u>https://www.europeristat.</u> <u>com/2-non-categorise/42-nl3-commentaries-on-smoking-rates-during-pregnancy.html</u>

¹⁰⁸ Lange, Shannon et al. 2018. National, regional, and global prevalence of smoking during pregnancy in the general population: a systematic review and meta-analysis. The Lancet Global Health, Volume 6, Issue 7, e769 - e776 <u>https://www.thelancet.com/journals/langlo/article/PIIS2214-109X%2818%2930223-7/fulltext</u>

¹⁰⁹ The European Perinatal Health Report. 2015. <u>https://www.europeristat.com/index.php/reports/european-perinatal-health-report-2015.html</u>

Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

Smedberg, J., Lupattelli, A., Mårdby, AC. et al. Characteristics of women who continue smoking during pregnancy: a crosssectional study of pregnant women and new mothers in 15 European countries. BMC Pregnancy Childbirth 14, 213 (2014). <u>https:// doi.org/10.1186/1471-2393-14-213</u> <u>https://bmcpregnancychildbirth.biomedcentral.com/articles/10.1186/1471-2393-14-213</u>

born to mothers who smoke while pregnant are at increased risk of behavioural disturbances, malformations (musculoskeletal defects, facial defects, limb reduction, missing/extra digits), decreased respiratory function, infant mortality, low birth-weight during infancy, sudden infant death syndrome (SIDS) and childhood obesity. Children exposed to smoking in utero are also at increased risk of asthma, respiratory infection, adult emphysema, infant colic, long-term growth impairment, intellectual disability, reproductive organ issues, and other illnesses.¹¹²

Smoking is one of the most significant yet avoidable causes of illness and death for both mother and infant during pregnancy. Women in lower socioeconomic categories are six to seven times more likely to smoke during pregnancy than women in higher categories. Research finds that pregnant women who did not smoke but were exposed to smoke at work or at home had a 23% increased risk of stillbirth and 13% increased risk of having a baby with defects compared to women who were not exposed to passive smoking during pregnancy. Exposure to more than 10 cigarettes a day was sufficient for this increased risk.¹¹³

It is important to recognise that smoking is an addiction and that women in pregnancy and childbirth should be supported towards optimum health in a way that empowers them rather than shames them.

A 2018 study of the prevalence of smoking during pregnancy and associated risk factors in Northern Greece,¹¹⁴ explored factors associated with smoking, from a sample of 3688 women, and similarly found that smoking during pregnancy was more common among naturally conceived pregnancies and women with a BMI greater than 30. About one third of women who smoked before pregnancy continued to smoke during pregnancy. Naturally conceiving, multiparous and immigrant women are less likely to quit smoking when pregnant

Lastly, in a longitudinal study, drawing on National Perinatal Surveys in the Republic of France,¹¹⁵ *Demiguel et al.* (2021) estimated proportions of smokers and the number of cigarettes smoked both just before pregnancy and during the third trimester, examining data from 1972 to 2016. Proportions of mothers quitting smoking were relatively stable across this time period (46.0% in 1972 and 45.8% in 2016). The number of cigarettes smoked just before pregnancy and in the third trimester decreased from 1995 onward. However, proportions of smokers remained high before (30.1%) and during the third trimester in 2016 (16.2%). Smoking in the third trimester was associated with a lower education level and lower income in both 2010 and 2016, whereas the association with age, country of birth and parity varied according to the survey year.

Alcohol

The WHO European Region has the highest level worldwide of alcohol consumption per capita among adults and the highest levels of alcohol- related harm.¹¹⁶ Estimates suggest a prevalence

¹¹⁵ V. Demiguel, B. Blondel, C. Bonnet, V. Nguyen-Thanh, M.-J. Saurel-Cubizolles and N. Regnault (2021) Trends in Tobacco Smoking in Pregnant Women: Data From French National Perinatal Surveys International Journal of Public Health 2021 Vol. 66 DOI: 10.3389/ijph.2021.602873 https://www.ssph-journal.org/articles/10.3389/ijph.2021.602873

¹¹² European Institute for Women's Health. (2022). Pregnancy and Smoking Policy Brief <u>https://eurohealth.ie/pregnancy-and-smoking/</u>

¹¹³ European Institute for Women's Health. (2022). Pregnancy and Smoking Policy Brief <u>https://eurohealth.ie/pregnancy-and-smoking</u>/

¹¹⁴ Ioannis Tsakiridis, Apostolos Mamopoulos, Georgios Papazisis, Stamatios Petousis, Athanasia Liozidou, Apostolos Athanasiadis, Themistoklis Dagklis, Prevalence of smoking during pregnancy and associated risk factors: a cross-sectional study in Northern Greece, European Journal of Public Health, Volume 28, Issue 2, April 2018, Pages 321-325, https://doi.org/10.1093/eurpub/cky004

World Health Organisation, Available at: <u>https://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/</u> publications/2013/status-report-on-alcohol-and-health-in-35-european-countries-2013

of 25.2% for alcohol use during pregnancy (any amount) in the WHO European Region. Potential harm to the foetus due to alcohol use is considered a public health concern by WHO Europe, and the wider WHO advocates strengthening the prevention and treatment of substance abuse in its Sustainable Development Goal factsheet.¹¹⁷

The EU Alcohol Strategy prioritises the protection of young people and unborn children from harm, seeking to reduce harmful exposure to alcohol during birth.¹¹⁸ Drinking alcohol during pregnancy is the leading known cause of birth defects and child developmental disorders. These defects are likely underreported, and the true extent of alcohol-related harm during pregnancy is as yet unknown. Nevertheless, many women continue to consume alcohol throughout their pregnancy. In Europe, the highest rates of alcohol consumption for this group were in Ireland where 60.4% of pregnant women consume alcohol during their pregnancy, a figure which is six times the global average. ^{119,120,121}

A 2017 study, including 7000 women across 11 European countries, assessed the proportion of women in Europe who drink alcohol during pregnancy. Almost 16% of women living in Europe consumed alcohol during pregnancy. In this study, the countries with the highest proportion of women reporting alcohol consumption during pregnancy were the United Kingdom (28.5%), and Switzerland (20.9%). The countries with the lowest proportion of women reporting alcohol consumption were Norway (4.1%), Sweden (7.2%) and Poland (9.7%). The women who reported alcohol consumption during pregnancy were more likely to be older, more highly educated, and employed.¹²² The link between education and smoking prior to pregnancy could not fully explain the differences found in proportions between the European countries.

In addition to excessive alcohol consumption, low to moderate alcohol consumption during pregnancy can also have an impact. Drawing on evidence from six studies performed in Australia, Denmark, England, Finland and the United States of America, a systematic review established that small to moderate doses of alcohol during pregnancy may have an impact on children's cognitive and socioemotional development. Furthermore, children exposed to prenatal alcohol experience have significantly more mental health problems, and behavioural, emotional and peer relationship problems, as well as being less attentive and experiencing shorter "longest attention episodes".¹²³ Another study determining the effects of low-to-moderate levels of maternal alcohol consumption on pregnancy and longer-term offspring outcomes, identified some evidence that even light prenatal alcohol consumption is associated with being small for gestational age and

¹¹⁷ World Health Organisation (2020) Fact sheet on the SDGs: Alcohol consumption and sustainable development. Available at: <u>https://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/publications/2020/fact-sheet-on-the-sdgs-alcohol-consumption-and-sustainable-development-2020</u>

¹¹⁸ European Commission (2006) Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions. An EU strategy to support Member States in reducing alcohol related harm. Brussels, Commission of the European Communities COM(2006) 625 Retrieved from: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0625:FIN:EN:PDF

¹¹⁹ European Alcohol Policy Alliance (Eurocare). 2013. Alcohol and pregnancy. <u>http://www.eurocare.org/resources/policy_issues/</u> <u>alcohol_and_pregnancy</u>

¹²⁰ WHO Europe. 2016. Prevention of harm caused by alcohol exposure in pregnancy. <u>http://www.drugsandalcohol.ie/26073/1/</u> WHO_Prevention-harm-caused-alcohol-exposure-pregnancy.pdf.

¹²¹ O'Sullivan, Claire. 17 Jan 2017. "Ireland tops list for pregnant women drinking." The Irish Examiner. <u>http://www.irishexaminer.com/</u> ireland/ireland-tops-list-for-pregnant-women-drinking-439408.html.

¹²² MGH Center for Women's Mental Health|February 6th, 2020 Alcohol and Pregnancy: Attitudes and Patterns of Drinking Vary Around the Globe <u>https://womensmentalhealth.org/posts/alcohol-pregnancy-attitudes-around-globe</u>

¹²³ WHO Is low dose alcohol exposure during pregnancy harmful? <u>https://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/publications/hen-summaries-of-network-members-reports/is-low-dose-alcohol-exposure-during-pregnancy-harmful</u>

preterm delivery, suggests that guidance could advise abstention as a precautionary principle but should explain the paucity of evidence.¹²⁴

Alcohol consumption is dangerous for an unborn child. When a pregnant woman drinks alcohol, it passes from the mother to the baby via the placenta and the baby's blood alcohol level reaches that of the mother. As the unborn child's liver is not fully developed, life-long damage to the health of the child can result. The most serious conditions are Foetal Alcohol Spectrum Disorders (FASD), and Foetal Alcohol Syndrome (FAS), caused by alcohol consumption during pregnancy.¹²⁵ It is important that women know that FASD is preventable by abstaining from alcohol consumption during pregnancy.¹²⁶ Alcohol consumption during pregnancy endangers the infant's physical and mental health and is associated with a wide spectrum of disorders.

There is currently no scientific consensus about the level of drinking during pregnancy at which damage occurs to the unborn child. Because the amount of alcohol required to cause foetal damage is still under debate, most public health guidelines recommend total abstention by women while pregnant. The UK Chief Medical Officer advises that "[w]omen who are pregnant or trying to conceive should avoid alcohol altogether. However, if they do choose to drink, to minimise the risk to the baby, we recommend they should not drink more than 1-2 units once or twice a week and should not get drunk."¹²⁷ Such messages can be confusing for some women, especially since 'the unit' measure is not clearly defined and open to interpretation.

The French Government provides an example of good practice. Since October 2006, the French Code of Public Health has required a warning label on alcohol packaging: "consumption of alcoholic beverages during pregnancy even in small amounts can seriously damage the child's health."¹²⁸ Slovenia has also launched campaigns taking a stance against the consumption of alcohol during pregnancy and in favour of awareness of consequences of alcohol consumption. The message "[n]o safe amount of alcohol, no safe alcoholic beverage and no safe time to drink alcohol during pregnancy" was the focus of Foetal Alcohol Syndrome Day in 2014 and 2015.¹²⁹

In terms of prevention strategies, a 2016 WHO Report into Alcohol Consumption in Pregnancy: Prevention of harm caused by alcohol exposure in pregnancy¹³⁰ includes 29 studies focusing on prevention efforts among non-pregnant and pregnant women. Several studies showed the effectiveness of pre-conception interventions in bringing down the risk of exposure to alcohol during a pregnancy by reducing risky drinking. The use of brief interventions for pregnant women suggested that they can be effective in women who drink at higher levels and when their partners are included. There was limited evidence for the effectiveness of using wider public health education approaches through campaigns, but results suggested that campaigns tailored to the target group and consideration given to the framing of the message may encourage women

¹²⁴ Mamluk L, Edwards HB, SavoviĐ J, Leach V, Jones T, Moore THM, Ijaz S, Lewis SJ, Donovan JL, Lawlor D, Smith GD, Fraser A, Zuccolo L. Low alcohol consumption and pregnancy and childhood outcomes: time to change guidelines indicating apparently 'safe' levels of alcohol during pregnancy? A systematic review and meta-analyses. BMJ Open. 2017 Aug 3;7(7):e015410. doi: 10.1136/bmjopen-2016-015410. PMID: 28775124; PMCID: PMC5642770.

¹²⁵ European Alcohol Policy Alliance (Eurocare). 2013. Alcohol and pregnancy. <u>http://www.eurocare.org/resources/policy_issues/</u> <u>alcohol_and_pregnancy</u>.

¹²⁶ WHO Europe. 2016. Prevention of harm caused by alcohol exposure in pregnancy. <u>http://www.drugsandalcohol.ie/26073/1/</u> WHO_Prevention-harm-caused-alcohol-exposure-pregnancy.pdf.

¹²⁷ NHS. 2012. Can I drink alcohol when I'm pregnant? <u>http://www.nhs.uk/chq/Pages/2270.aspx?CategoryID=54#close</u>.

¹²⁸ ICAP. 2012. Health warning labels. <u>http://www.icap.org/table/HealthWarningLabels</u>.

¹²⁹ WHO Europe. 2016. Prevention of harm caused by alcohol exposure in pregnancy. <u>http://www.drugsandalcohol.ie/26073/1/</u> WHO Prevention-harm-caused-alcohol-exposure-pregnancy.pdf.

¹³⁰ World Health Organisation (2016) Prevention of harm caused by alcohol exposure in pregnancy. Rapid review and case studies from Member States. Available at: <u>https://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/publications/2016/prevention-of-harm-caused-by-alcohol-exposure-in-pregnancy.-rapid-review-and-case-studies-from-member-states-2016</u>

to abstain from alcohol during pregnancy.¹³¹ A united European strategy to prevent alcohol consumption during pregnancy with focus on countries with the highest consumption has been recommended.¹³²

Body Mass Index

Generally, obesity is rising in Europe.¹³³ As of 2014, about 52% of the EU population was overweight or obese. A statistic which rose slightly to 52.7% in 2019.¹³⁴ A report by the Organisation for Economic and Cooperative Development (OECD) indicated that the prevalence of obesity in EU Member States increased from 11% in 2000 to 16% in 2014 and, as of 2014, reports indicate that the prevalence of being overweight and obese in the EU account for 52% - 53.1% of the population¹³⁵ with highest prevalence in Hungary, Czech Republic and Lithuania; and lowest in Switzerland, France and Denmark. While most European countries do not systematically report obesity figures in their pregnant population, the prevalence of maternal obesity varies from 7% to 25% and seems strongly related to social and educational inequalities.¹³⁶

Maintaining good health and guarding against obesity in women during reproductive years is important for both mother and child.¹³⁷ **Obesity prior to conception and during pregnancy can compromise** maternal and child health outcomes and generate perinatal complications, including preeclampsia, GDM, caesarean delivery, large-for-gestational-age infants, stillbirth and an increased risk for overweight and obesity later in life for the child.¹³⁸ According to PERISTAT, maternal weight before and during pregnancy affects the course of pregnancy, its outcome, and the child's lifelong health, with implications for the life course and multi-generational health. Adding information about women's pre-pregnancy BMI to routine surveillance systems for maternal and newborn health should be a priority in countries where these data are not available".¹³⁹

Principal controversies around the management of BMI during pregnancy are related to (1) the value of repeated weighing during pregnancy, (2) the optimal gestational weight gain to advise and corresponding lifestyle messages to deliver to achieve this, (3) the optimal strategy and timing of screening for GDM and (4) the optimal timing and mode of delivery.¹⁴⁰

Scholin, L. (2016) Prevention of harm caused by alcohol exposure in pregnancy: Rapid review and case studies from Member States<u>https://www.euro.who.int/__data/assets/pdf_file/0005/318074/Prevention-harm-caused-alcohol-exposure-pregnancy.pdf</u>

¹³² MGH Center for Women's Mental Health|February 6th, 2020. Alcohol and Pregnancy: Attitudes and Patterns of Drinking Vary Around the Globe <u>https://womensmentalhealth.org/posts/alcohol-pregnancy-attitudes-around-globe</u>

¹³³ World Health Organization (2018) Maternal nutrition, physical activity and weight gain during pregnancy <u>https://gateway.euro.</u> who.int/en/datasets/maternal-nutrition-survey/

¹³⁴ Eurostat. 2018. Overweight and obesity - BMI statistics. <u>https://ec.europa.eu/eurostat/statistics-explained/index.php/Overweight</u> <u>and_obesity - BMI statistics</u> [Access 14 September 2018]

¹³⁵ OECD. Overweight and Obesity Among Adults. Health at a Glance: Europe 2016: State of Health in the EU Cycle. Paris: OECD Publishing,2016.

¹³⁶ Devlieger, R., Benhalima, K., Damm, P., Van Assche, A., Mathieu, C., Mahmood, T., ... & Bogaerts, A. (2016). Maternal obesity in Europe: where do we stand and how to move forward?: A scientific paper commissioned by the European Board and College of Obstetrics and Gynaecology (EBCOG). European Journal of Obstetrics & Gynecology and Reproductive Biology, 201, 203-208.

¹³⁷ Hanson, Mark, et al. (2017). "Interventions to prevent maternal obesity before conception, during pregnancy, and post partum." The lancet Diabetes & endocrinology 5.1: 65-76.

¹³⁸ Devlieger R., Benhalima K., Damm P. et al. Maternal obesity in Europe: where do we stand and how to move forward? European Journal of Obstetrics and Gynaecology 2016.

¹³⁹ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

¹⁴⁰ Roland Devlieger, Katrien Benhalima, Peter Damm, André Van Assche, Chantal Mathieu, Tahir Mahmood, Fidelma Dunne, Annick Bogaerts,. Maternal obesity in Europe: where do we stand and how to move forward?: A scientific paper commissioned by the European Board and College of Obstetrics and Gynaecology (EBCOG), European Journal of Obstetrics & Gynecology and Reproductive Biology, Volume 201, 2016, Pages 203-208, ISSN 0301-2115, https://doi.org/10.1016/j.ejogrb.2016.04.005.
Gestational weight gain patterns are strongly related to pre-pregnancy BMI.^{141,142} Gestational weight gain differs according to pre-pregnancy BMI and is related to the risks of adverse maternal and child health outcomes. **Gestational weight gain charts for women in different pre-pregnancy BMI groups enable identification of women and babies at risk for adverse health outcomes.** Santos et al. aimed to construct gestational weight gain reference charts for underweight, normal weight, overweight and obese women and to compare these charts with those obtained in women with uncomplicated term pregnancies.¹⁴³

Despite a focus on the relationship between maternal obesity and negative health outcomes, being underweight has a similar risk of clinical miscarriage as being overweight¹⁴⁴ and risk of low birthweight and preterm birth is also increased in underweight pregnancies.¹⁴⁵ France has the highest prevalence of an underweight population of 4% compared with the EU average prevalence of 2%.¹⁴⁶ It is important to acknowledge that though maternal underweight, overweight, and obesity have been associated with a higher risk of miscarriage, most reports and all meta-analyses have addressed overweight (high BMI)."¹⁴⁷ A focus must remain on a balanced and healthy BMI overall. A 2016 publication commissioned by the European Board and College of Obstetrics and Gynaecology¹⁴⁸ noted that to adequately support health during pregnancy, the focus is on maintaining a balanced weight, without gaining too much or not gaining enough weight.¹⁴⁹

Clinical guidelines addressing healthy weight before, during, and after pregnancy have been introduced in some countries and a cross-national comparison of maternal weight guidelines has been conducted. Fifty-three countries reported either a formal or informal policy regarding maternal weight. The majority of these policies included guidelines to assess maternal weight at the first prenatal visit (90%), to monitor gestational weight gain during pregnancy (81%), and to provide recommendations to women about healthy gestational weight gain (62%). Guidelines related to preconception (42%) and postpartum (13%) weight were less common. Only 8% of countries reported policies that included all four fundamental guidelines. Guideline content and rationale varied considerably between countries, and respondents perceived that within their country, policies were not widely known. There was great variation among countries.¹⁵⁰

¹⁴¹ Santos, S., Eekhout, I., Voerman, E. et al. Gestational weight gain charts for different body mass index groups for women in Europe, North America, and Oceania. BMC Med 16, 201 (2018). https://doi.org/10.1186/s12916-018-1189-1

¹⁴² Buckley BS, Harreiter J, Damm P, Corcoy R, Chico A, Simmons D, Vellinga A, Dunne F; DALI Core Investigator Group. Gestational diabetes mellitus in Europe: prevalence, current screening practice and barriers to screening. A review. Diabet Med. 2012 Jul;29(7):844-54. doi: 10.1111/j.1464-5491.2011.03541.x. PMID: 22150506.

¹⁴³ Santos, S., Eekhout, I., Voerman, E. et al. Gestational weight gain charts for different body mass index groups for women in Europe, North America, and Oceania. BMC Med 16, 201 (2018). https://doi.org/10.1186/s12916-018-1189-1

¹⁴⁴ Systematic review and meta-analysis on the association of pre-pregnancy underweight and miscarriage. Balsells, Garcia-Patterson, and Corcoy. EJOG. 2016. <u>https://www.ejog.org/article/S0301-2115(16)30960-5/fulltext</u>

¹⁴⁵ Maternal underweight and the risk of preterm birth low birth weight: a systematic review and meta-analyses. 2011 Hans et al Int J Epidemiol

¹⁴⁶ Adilson Marques, Miguel Peralta, Ana Naia, Nuno Loureiro, Margarida Gaspar de Matos, Prevalence of adult overweight and obesity in 20 European countries, 2014, European Journal of Public Health, Volume 28, Issue 2, April 2018, Pages 295-300, <u>https:// doi.org/10.1093/eurpub/ckx143</u>

¹⁴⁷ Adilson Marques, Miguel Peralta, Ana Naia, Nuno Loureiro, Margarida Gaspar de Matos, Prevalence of adult overweight and obesity in 20 European countries, 2014, European Journal of Public Health, Volume 28, Issue 2, April 2018, Pages 295-300, <u>https:// doi.org/10.1093/eurpub/ckx143</u>

¹⁴⁸ Roland Devlieger, Katrien Benhalima, Peter Damm, André Van Assche, Chantal Mathieu, Tahir Mahmood, Fidelma Dunne, Annick Bogaerts,

Maternal obesity in Europe: where do we stand and how to move forward?: A scientific paper commissioned by the European Board and College of Obstetrics and Gynaecology (EBCOG), European Journal of Obstetrics & Gynecology and Reproductive Biology, Volume 201, 2016, Pages 203-208, ISSN 0301-2115, https://doi.org/10.1016/j.ejogrb.2016.04.005.

¹⁴⁹ Davidson, Helen. 07 June2017. "Global Study finds 75% of pregnant women don't have healthy weight gain" The Guardian. <u>https://www.theguardian.com/lifeandstyle/2017/jun/07/global-study-finds-75-of-pregnant-women-dont-have-healthy-weight-gain</u>

¹⁵⁰ Scott, C., Andersen, C. T., Valdez, N., Mardones, F., Nohr, E. A., Poston, L., Loetscher, K. C., & Abrams, B. (2014). No global consensus: a cross-sectional survey of maternal weight policies. BMC pregnancy and childbirth, 14, 167. https://doi.org/10.1186/1471-2393-14-167

Exercise

A factsheet for 28 EU Member States detailed physical activity during pregnancy and childbirth, including policies and targets within countries specifically towards pregnancy, documenting that few countries have specific recommendations for exercising during pregnancy.¹⁵¹ The Zero Nourishment Survey documents eating and exercise habits in the EU and provides details on the differences between vulnerable and non-vulnerable women. **Vulnerable women show a less healthy lifestyle than non-vulnerable women**, due to lower consumption of water, fruit and vegetables and supplements. Vulnerable women are more likely to be smokers, more likely to smoke during pregnancy and breastfeeding, receive less support from their spouse and feel stressed more often. Vulnerable women are also less likely to breastfeed, and take less advantage of health care professionals.¹⁵² Socio-economic trends have been associated with participation in exercise during pregnancy.

A meta-analysis, including over 2000 women, demonstrated that aerobic exercise and moderateintensity strength/toning exercise performed three or four days per week throughout pregnancy was not associated with an increased risk for preterm births or low birth weight infants for normalweight women with single, uncomplicated pregnancies. However, despite recommendations from physicians to begin or maintain an exercise program during pregnancy, only about 40% of the study participants were found to have exercised.¹⁵³

A clinical trial in Spain focusing on cardio-metabolic health noted that exercise reduced the risk of excessive gestational weight, GDM, hypertension, obesity, and other cardio-metabolic conditions, and increased the likelihood of pre-pregnancy return within six months. Cardio-metabolic health also reduced the risk of newborn babies of larger than average size, and of childhood overweight/ obesity during the first year. **This suggests that pregnancy exercise might protect maternal and child health.**¹⁵⁴

There is increasing evidence that physical activity during pregnancy is beneficial to maternal physiological and psychological health and is generally not detrimental to the foetal cardiovascular system nor neuronal function in the developing child. In general, neither low key, moderate maternal exercise nor relaxation techniques were found to have a harmful effect on the developing child. However, some forms of exercise could have at least a transient unfavourable effect, though there is not enough evidence to enable a general conclusive statement on this subject. This is due in part to the lack of longitudinal studies on the metabolic and cognitive effects of regular exercise during pregnancy and the wide diversity of methods used to assess and thus compare effects.¹⁵⁵

Nutrition

Nutritional needs change with pregnancy and breastfeeding, and a well-balanced diet is important for both women and their children. During pregnancy and breastfeeding, women have further

¹⁵¹ European Commission (2018) Physical Activity Factsheets for the 28 European Union Member States of the WHO European Region <u>https://sport.ec.europa.eu/sites/default/files/physical-activity-factsheet_who-eu-201811_en.pdf</u>

¹⁵² Together - Zero measurement results pregnant women <u>https://ec.europa.eu/health/nutrition_physical_activity/projects/</u> together_zero_measurement_en

¹⁵³ Cooper DB, Yang L. Pregnancy And Exercise. [Updated 2021 Apr 26]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <u>https://www.ncbi.nlm.nih.gov/books/NBK430821/</u>

¹⁵⁴ Perales, María, Pedro L. Valenzuela, Ruben Barakat, Yaiza Cordero, Mireia Peláez, Carmen López, Luis M. Ruilope, Alejandro Santos-Lozano, and Alejandro Lucia. 2020. "Gestational Exercise and Maternal and Child Health: Effects until Delivery and at Post-Natal Follow-up" Journal of Clinical Medicine 9, no. 2: 379. <u>https://doi.org/10.3390/jcm9020379</u>

¹⁵⁵ Bauer I, Hartkopf J, Kullmann S, et al Spotlight on the fetus: how physical activity during pregnancy influences fetal health: a narrative review BMJ Open Sport & Exercise Medicine 2020;6:e000658. doi: 10.1136/bmjsem-2019-000658

requirements for a range of nutrients including vitamin B1, B2, B6, folic acid, calcium, zinc, vitamin E, selenium and vitamin C. In order to meet higher nutrient requirements, women who are pregnant or lactating must consume more nutrient dense foods.¹⁵⁶

As nearly half of pregnancies in the EU are unplanned, it is important that women of reproductive age maintain good nutrition and healthy body weight if they desire to be prepared for a possibility of pregnancy.¹⁵⁷ Research suggests that weight control interventions for women who are outside of an optimum BMI range are likely to be more effective either in the pre-conception or postpartum periods as opposed to during pregnancy itself. In order to avoid malnutrition during pregnancy, weight management can be guided by a nutritionist if deemed necessary by a health professional.¹⁵⁸

Disparities within the EU related to nutrition are situated in a context of food disparities more broadly across Europe: A 2007 publication examined socially- and culturally-patterned differences in food habits both between and within European populations. Overall food availability demonstrated a north-south differentiation in food habits. Generally, the availability of most food items, including foods such as vegetable fats, animal lipids and sugar products, has decreased over the past 10 years. Households in which the head of the household was in a lower education category reported lower availability for most food items. Data from the Data Food Networking (DAFNE) databank may serve as a tool for identifying and quantifying variation in food habits in Europe, as well as for providing information on the socio-economic determinants of food preferences.¹⁵⁹

Maternal dietary habits and the use of dietary supplements during pregnancy vary significantly across Europe and in some instances may be influenced by national recommendations. A 2014 publication in the Maternal and Child Health Journal looked at Dietary Habits and Supplement Use in Relation to National Pregnancy Recommendations, drawing on data from the EuroPrevall Birth Cohort. Findings demonstrated that the most **commonly taken supplement in pregnancy was folic acid** (ranging between 55.6% Lithuania – 97.8% Spain) and was favoured by older, highereducated mothers. Vitamin D supplementation across the cohort was very poor (0.3% Spain – 5.1% Lithuania). There were significant differences in foods consumed in different countries during pregnancy for example, 2.7% Dutch mothers avoided eating peanuts, compared with 44.4 % of British mothers. Some countries have minimal recommendations for nutrition during pregnancy i.e. Lithuania, Poland and Spain; while others have similar, very specific recommendations i.e. the UK, the Netherlands, Iceland, and Greece. Allergy specific recommendations and nutrition supplement recommendations were each associated with food avoidance during pregnancy.¹⁶⁰

The WHO for the European Region published a report in 2017 on Proper Maternal Nutrition during Pregnancy Planning and Pregnancy, which drew on experience and research from Latvia, to make recommendations for adequate intake of nutrients before and during pregnancy.¹⁶¹ The

¹⁵⁶ Kominiarek MA, Rajan P. Nutrition Recommendations in Pregnancy and Lactation. Med Clin North Am. 2016;100(6):1199–1215. doi:10.1016/j.mcna.2016.06.004

¹⁵⁷ World Health Organisation. Good Maternal Nutrition The best start in life. WHO 2016.

¹⁵⁸ Hanson M., Barker M., Dodd J. et al. Interventions to prevent maternal obesity before conception, during pregnancy and postpartum. Lancet Series Diabetes and Endocrinology 2017; Jan 5(1): 65-76.

¹⁵⁹ Trichopoulou, A., Naska, A., & Costacou, T. (2002). Disparities in food habits across Europe. Proceedings of the Nutrition Society, 61(4), 553-558. doi:10.1079/PNS2002188

¹⁶⁰ Oliver, E.M., Grimshaw, K.E.C., Schoemaker, A.A. et al. Dietary Habits and Supplement Use in Relation to National Pregnancy Recommendations: Data from the EuroPrevall Birth Cohort. Matern Child Health J 18, 2408–2425 (2014). <u>https://doi.org/10.1007/s10995-014-1480-5</u>

¹⁶¹ Meija, L. and Rezeberga, M. (2017) Proper maternal nutrition during pregnancy planning and pregnancy: a healthy start in life: <u>https://www.euro.who.int/______data/assets/pdf______file/0003/337566/Maternal-nutrition-Eng.pdf</u>

WHO has also mapped the physical in-take and impact of nutrients during pregnancy, as well as the optimum nutrient levels for women to aim for during pregnancy.¹⁶²

Nutritional status is impacted by socio-economic and migration status. A study carried out in the Netherlands provided an overview of the self-reported health status and health behaviours of pregnant women under midwife-led primary care and identified differences in nutritional status according to educational level (as a proxy for socio-economic status) and ethnicity (as a proxy for immigration status).¹⁶³ Women who had lower education levels were especially more likely to not to take folic acid supplementation, and somewhat more likely to skip breakfast daily, be obese, underweight and depressed or anxious. Non-western European women were especially more likely more likely not to take folic acid supplementation.

Fertility

Birth rates in Europe have declined over the last fifty years. This decline is related to factors such as changing societal roles of women and delays in having a first child, among others.¹⁶⁴ Age, lifestyle and environmental conditions also have repercussions for fertility. **In the EU, even in countries with the highest fertility rates, birth rates are below the level required to avoid population decline**. The EU average fertility rate is 1.6, and a fertility rate of 2.1 is needed to maintain population rates without migration.¹⁶⁵ **The declining birth and fertility rates will become increasingly problematic in light of the aging Baby Boom generation moving into retirement.**

Infertility is a global medical problem of the reproductive system which can affect the quality of **women's lives.**¹⁶⁶ **One in seven couples have difficulty conceiving.** Recent studies have indicated a decline in male fertility by half since 1980.¹⁶⁷ Evidence is not conclusive, due to under diagnosis of infertility, particularly diagnosis and research in male infertility. There are also many myths and stigma surrounding infertility. Causes of infertility vary, with one-third of cases identified in women; one-third in men; one-tenth in both partners, and are undetermined in 10 - 20% of cases. Infertility and its treatment have physical and emotional impacts on both individuals in the relationship and on the relationship itself, including anxiety, depression and stress.¹⁶⁸ For women, fertility treatment can be particularly difficult mentally and physically if taking place while in employment.

Although treatment of infertility is still cause-based, unexplained causes are most often the underlying reason. **The invention of in vitro fertilisation (IVF) has changed the management of infertility globally**. Different European scientific organisations, together with the European Board and College of Obstetrics and Gynaecology (EBCOG), should provide recommendations to the

¹⁶² World Health Organisation (2016) Good Maternal Nutrition: The best start in life. :https://www.euro.who.int/data/assets/pdf_file/0008/313667/Good-maternal-nutrition-The-best-start-in-life.pdf

¹⁶³ Baron R, Manniën J, te Velde SJ, Klomp T, Hutton EK, Brug J. Socio-demographic inequalities across a range of health status indicators and health behaviours among pregnant women in prenatal primary care: a cross-sectional study. BMC Pregnancy Childbirth. 2015 Oct 13;15:261. doi: 10.1186/s12884-015-0676-z. PMID: 26463046; PMCID: PMC4604767

¹⁶⁴ William Reville. "Why is Europe losing the will to breed? Despite Europe's wonderful heritage, the continent is losing faith in itself, and birth rates have collapsed." Irish Times. May 15, 2016. <u>https://www.irishtimes.com/news/science/why-is-europe-losing-thewill-to-breed-1.2644169</u>

¹⁶⁵ Federica Cocco. "Highest fertility rates in Europe still below 'replenishment level." Financial Times. March 28, 2018. <u>https://www.ft.com/content/d54e4fe8-3269-11e8-b5bf-23cb17fd1498</u>

¹⁶⁶ Ioannis E. Messinis, Christina I. Messini, Alexandros Daponte, Antonios Garas, Tahir Mahmood, The current situation of infertility services provision in Europe, European Journal of Obstetrics & Gynecology and Reproductive Biology, Volume 207, 2016, Pages 200-204, ISSN 0301-2115, https://doi.org/10.1016/j.ejogrb.2016.10.004.

¹⁶⁷ Robin McKie. "The infertility crisis is beyond doubt. Now scientists must find the cause." The Guardian. 30 July 2017. <u>https://www.theguardian.com/science/2017/jul/29/infertility-crisis-sperm-counts-halved</u>

¹⁶⁸ Harvard Medical School. "The psychological impact of infertility and its treatment." May 2009. <u>https://www.health.harvard.edu/</u> <u>newsletter_article/The-psychological-impact-of-infertility-and-its-treatment</u>.

European Union on the development of common legislation to streamline quality assured clinical care for infertile couples. This will hopefully help to eliminate possible inequalities, providing evidence based services according to patients' needs, and reduce cross border healthcare demand amongst European countries. There are differences in legislation between different countries, which encourage "infertility tourism". Women cross borders in order to obtain access to those treatment modalities that are not provided in their own country. Common reasons for this mobility include to obtain oocyte (a cell which forms an ovum which can be fertilised by sperm) donations as well as the high cost of the services locally are common reasons for this mobility.¹⁶⁹

How changes in labour market conditions and economic growth were associated with fertility before and during the Great Recession in Europe in 2002–2014 has been investigated.¹⁷⁰ In a study entitled 'The Great Recession and Fertility in Europe: A sub-national analysis': the authors use data for 251 European regions within 28 European Union Member States prior to the withdrawal of the United Kingdom in January 2020, an approach which stands in contrast to prior work and a focus on the national level. **The findings revealed that fertility decline was strongly related to unemployment increase;** a relationship that was significant at different reproductive ages. Deteriorating economic conditions were associated with a stronger decline in fertility during the economic recession as compared with the pre-recession period. This evidence suggests the salience of factors such as broader perception of uncertainty that could not be captured but rose to prominence during the Great Recession. Furthermore, strongest fertility declines were observed in Southern Europe, Ireland and parts of Central and Eastern Europe, that is, countries and regions where labour market conditions deteriorated most during the recession period. In Western Europe, and especially in the Nordic countries, fertility rates were not closely associated with the recession indicators.

Educational differences in women's fertility also vary strongly across high-income countries

and over time, however, knowledge about how differences play out at the sub-national regional level remains limited. Harmonising data from population registers, censuses, and large-sample surveys for 15 countries, an examination was carried out of educational differences in the cohort fertility rate (CFR) at the sub-national regional level of a large number of European countries. The authors documented an overall negative gradient between the CFR and level of education, and notable regional variation in the gradient, underlining the variability of educational gradients in women's fertility, and suggesting that higher levels of education may be associated with less negative gradients.¹⁷¹

Trends also relate to migration. In a comparison of the fertility of Ghanaian migrants in Europe with non-migrants in Ghana, a contrast was found between the fertility of those who never emigrated from Ghana and Ghanaian migrants who are residing in the UK or the Netherlands. Findings demonstrated that Ghanaian migrants postpone first childbirth compared with non-migrants. Age also featured, with differences being largest at ages 20 to 24 for women and 20 to 29 for men. Education seemed to be an important determinant of the postponement of

¹⁶⁹ Messinis, I. E., Messini, C. I., Daponte, A., Garas, A., & Mahmood, T. (2016). The current situation of infertility services provision in Europe. European Journal of Obstetrics & Gynecology and Reproductive Biology, 207, 200-204.

¹⁷⁰ Matysiak, A., Sobotka, T. & Vignoli, D. The Great Recession and Fertility in Europe: A Sub-national Analysis. Eur J Population 37, 29–64 (2021). https://doi.org/10.1007/s10680-020-09556-y

¹⁷¹ Nisén, J., Klüsener, S., Dahlberg, J. et al. Educational Differences in Cohort Fertility Across Sub-national Regions in Europe. Eur J Population 37, 263-295 (2021). https://doi.org/10.1007/s10680-020-09562-0

first childbirth in Ghana. Migrants had fewer children than non-migrants and this difference diminished considerably when taking into account their level of education.¹⁷³

Research has also examined postponement of having a child and the shift to low and unstable fertility levels. An examination of fertility trends and variation in countries that had completed the transition from high to around-replacement fertility between the 1950s and 1980s encompassed Europe, East Asia and North America.¹⁷⁴ A central finding was that there was no obvious theoretical or empirical threshold around which period fertility would tend to stabilise. Period fertility rates usually continued falling once the threshold of replacement fertility was crossed, often to very low levels. The long-lasting trend towards delayed parenthood is central for understanding the diverse, low and unstable post-transitional fertility patterns. In many countries in Europe this shift to a late childbearing pattern has negatively affected fertility rates for more than four decades.

Air Pollution and climate change represents an area for future studies. Published in 2021, a climate study related to the effect of current and future maternal exposure to near-surface ozone on preterm birth in 30 European countries.¹⁷⁵ Preterm birth is the largest contributor to neonatal mortality globally and is also associated with several adverse health outcomes. Recent evidence has suggested a link between exposure to air pollution and an increased risk for preterm birth and in this context the paper estimates the proportion of preterm births attributable to maternal ozone exposure in 30 European countries. Due to climate change, the ozone-related preterm birth burden might slightly increase by 2050 in Central and Southern Europe, and decrease in Eastern and Northern Europe.

Approaches to health promotion and disease prevention:

Behaviour Change

Behaviour change techniques can be employed to strengthen responses to health promotion and disease prevention. Chan et al (2020) set out global research priorities for social, behavioural and community engagement interventions for maternal, newborn, and child health, drawing on the knowledge and contributions of 310 experts.¹⁷⁵ These priorities were: maternal and newborn health, with research to improve the delivery of social, behavioural and community education (SBCE) interventions that strengthen self- and family- care practices and care-seeking; child health with the delivery of SBCE interventions emphasising determinants of service use, breastfeeding and nutrition practices; and the need for better integration of SBCE into facility-based maternal health services.

In a 2020 scoping review examining changing behaviour in pregnant women, thirty studies were identified that addressed weight management, smoking cessation, general health education, nutrition, physical activity, alcohol consumption and dental health. This was a global study, which included four European countries in the review: one study from the Republic of Ireland and three from the United Kingdom. A principal behaviour change approach was knowledge

¹⁷² Wolf, K, Mulder, CH. Comparing the fertility of Ghanaian migrants in Europe with non-migrants in Ghana. Popul Space Place. 2019; 25:e2171. <u>https://doi.org/10.1002/psp.2171</u>

¹⁷³ Sobotka, Tómás (2017) Post-Transitional Fertility: Childbearing Postponement and the Shift to Low and Unstable Fertility Levels Vienna Institute of Demography Working Papers No. 01/2017. Austrian Academy of Sciences (ÖAW), Vienna Institute of Demography (VID), Vienna. <u>https://www.econstor.eu/handle/10419/156318</u>

¹⁷⁴ J. Ekland, D. Olsson, B. Forsberg, C. Andersson and H. Orru (2021). The effect of current and future maternal exposure to nearsurface ozone on preterm birth in 30 European countries—an EU-wide health impact assessment. Environmental Research Letters Vol. 16 Issue 5 Pages 055005. DOI: 10.1088/1748-9326/abe6c4 <u>https://iopscience.iop.org/article/10.1088/1748-9326/abe6c4/pdf</u>

¹⁷⁵ Chan, G., Storey, J.D., Das, M.K. et al. Global research priorities for social, behavioural and community engagement interventions for maternal, newborn and child health. Health Res Policy Sys 18, 97 (2020). <u>https://doi.org/10.1186/s12961-020-00597-7</u>

gain through education. Seventeen studies included three or more aspects of empowerment as part of the intervention, including skills, competencies, and the involvement of midwives. **The study recommended a need for behaviour change programmes during pregnancy that aim to empower women. Midwives should develop, manage, implement or support behaviour change programmes during pregnancy**.¹⁷⁶

Another systematic review of behaviour change interventions identified 14 studies examining how to enhance and sustain physical activity during pregnancy.¹⁷⁷ Interventions included counselling (n=6), structured exercise (n=6) and education (n=2), with common behaviour change techniques being goal setting and planning, feedback, repetition and substitution, shaping knowledge and comparison of behaviours, and regular face-to-face meetings. **Results within studies demonstrated that interventions comprising these methods yielded more physical activity among members of the intervention groups.**

In 2016, mixed methods research across three European countries collected data on the beliefs, barriers, and preferences of European women with a higher BMI towards adopting a healthier lifestyle in pregnancy so as to minimize the risk of developing GDM.¹⁷⁸ The findings demonstrated that: women preferred to obtain detailed information about their personal risk; **the health of their baby was a major motivating factor to adopting a healthier lifestyle**; perceived barriers for physical activity included tiredness, experiencing physical complaints, and insufficient time reported by women with children; women preferred to obtain support from their partner, as well as health professionals, and valued flexible lifestyle programs.

Lastly, a qualitative study situated in Finland identified target behaviours within weight management interventions for women who are overweight during pregnancy and the postpartum period.¹⁷⁹ The study found that both women and the public health nurses felt a need to find consistent ways to reduce a higher BMI. The use of health technology and smart wearables were identified to support a more enhanced understanding of the women's lifestyles, as well as robust support for weight management and discreet counselling. Lack of resources for support during perinatal care, and especially after birth, were identified as barriers to weight management. Support from the family was the most important factor. Participating women also expressed a conflict between pregnancy as an excuse to engage in unhealthy habits and pregnancy as a motivational period for a change of lifestyle.

Screening

Screening is complex. The WHO articulates when screening is appropriate and how to get it right, addressing the ethics and logistics of screening, it is conceptualised as taking place across the life course. Medical screening detects previously undetected diseases/conditions in individuals and populations. Although there is not a single and complete definition, **screening is usually defined as the likely identification of unrecognized disease/condition in an apparently healthy individual or population by means of tests, examinations or other procedures that can be**

¹⁷⁶ Laura A. Zinsser, Kathrin Stoll, Frank Wieber, Jessica Pehlke-Milde, Mechthild M. Gross, (2020). Changing behaviour in pregnant women: A scoping review, Midwifery, Volume 85, 102680, ISSN 0266-6138, <u>https://doi.org/10.1016/j.midw.2020.102680</u>.

¹⁷⁷ Currie S, Sinclair M, Murphy MH, Madden E, Dunwoody L, et al. (2013) Reducing the Decline in Physical Activity during Pregnancy: A Systematic Review of Behaviour Change Interventions. PLOS ONE 8(6): e66385. https://doi.org/10.1371/journal.pone.0066385

¹⁷⁸ Jelsma JG, van Leeuwen KM, Oostdam N, et al. Beliefs, Barriers, and Preferences of European Overweight Women to Adopt a Healthier Lifestyle in Pregnancy to Minimize Risk of Developing Gestational Diabetes Mellitus: An Explorative Study. J Pregnancy. 2016;2016:3435791. doi:10.1155/2016/3435791

¹⁷⁹ Saarikko, J., Niela-Vilén, H., Rahmani, A.M. et al. Identifying target behaviors for weight management interventions for women who are overweight during pregnancy and the postpartum period: a qualitative study informed by the Behaviour Change Wheel. BMC Pregnancy Childbirth 21, 200 (2021). <u>https://doi.org/10.1186/s12884-021-03689-6</u>

applied rapidly and easily to the target population.¹⁸⁰ Benefit/harm profiles for screening tests vary widely and depend on a range of factors.

In a collaboration between the European Observatory on Health Systems and Policies, and the WHO Regional Office for Europe, a wider WHO European initiative aimed to improve screening practice throughout the life-course and thereby to increase effectiveness, maximize benefits and minimize harm was developed.¹⁸¹ While screening relates to health in general, it is relevant to maternal health too. Key messages by the WHO are that: screening may bring benefits but also harm; just because it can be done does not mean that it should be done and resources may be better used in other ways: population screening should be done within an organized screening programme that includes core elements, from identifying target populations, through treatment, to monitoring and evaluation. There is no justification for unorganized screening. Putting together a screening programme is a complex task and requires many components to work both inside and beyond the health system. Wilson & Jungner's screening principles remain the gold standard when deciding on implementing, continuing or discontinuing screening programmes, although they often require expert judgement as well as high quality evidence, consideration of resource implications, effectiveness and cost effectiveness, as well as adaptation to country context. Care is needed when deciding to implement a screening programme to protect against the potential for commercially driven vested interests and supplier-induced patient demand. It is essential that decisions to implement, continue, or discontinue screening programmes are made transparent, setting out clearly the arguments for and against. It is also important to identify barriers to maximizing the effectiveness of programmes and put in place measures to overcome them. Potential barriers may relate to health system structures, such as payment models and availability of human, physical and financial resources. Potential solutions include financing models that encourage appropriate use, improving information flows, ensuring health workers have appropriate skills, and removing logistical barriers.

Risks posed by screening tests are misdiagnoses. First, false-positive results can lead to unnecessary psychological distress, investigations and treatments, while false-negative results can create a false sense of security and may delay diagnosis^{182,183} Second, screening tests can also lead to over-diagnosis, where a positive result is correct but irrelevant because effective treatment is not available or symptoms are unlikely to arise during the patient's lifetime.¹⁸⁴ Third, beside potential individual harm, screening can increase costs both for the health system and the community.¹⁸⁵ While there is a growing global trend towards more health screening, awareness of the potential harms of these tests among policy makers, health professionals and the public

¹⁸⁰ World Health Organization (2020) Screening: When is it appropriate and how can we get it right? <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/publications/2020/screening.-when-is-it-appropriate-and-how-can-we-get-it-right-2020</u>

¹⁸¹ World Health Organization (2020) Screening: When is it appropriate and how can we get it right? <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/publications/2020/screening.-when-is-it-appropriate-and-how-canwe-get-it-right-2020</u>

¹⁸² Toft, E. L., Kaae, S. E., Malmqvist, J., & Brodersen, J. (2019). Psychosocial consequences of receiving false-positive colorectal cancer screening results: a qualitative study. Scandinavian journal of primary health care, 37(2), 145–154. <u>https://doi.org/10.1080/ 02813432.2019.1608040</u>

¹⁸³ Birbeck G. L. (2000). The benefits of screening must outweigh the risks and costs. The Western journal of medicine, 172(5), 308-309. <u>https://doi.org/10.1136/ewjm.172.5.308</u>

¹⁸⁴ Bulliard, JL., Chiolero, A. Screening and overdiagnosis: public health implications. Public Health Rev 36, 8 (2015). https://doi. org/10.1186/s40985-015-0012-1

¹⁸⁵ Iragorri, N., Spackman, E. Assessing the value of screening tools: reviewing the challenges and opportunities of cost-effectiveness analysis. Public Health Rev 39, 17 (2018). <u>https://doi.org/10.1186/s40985-018-0093-8</u>

has been reported to be sub-optimal. Consequently, screening tests can be either inappropriately under-used or over-used.¹⁸⁶

Research on antenatal screening practices in the WHO European region, including 42 participating countries, collected data on national guidelines and supplemental use of other guidelines.¹⁸⁷ Comparative findings were as follows:

- ▲ 36 (86%) reported national guidelines on Antenatal Care screening
- ▲ 26 (61.9%) reported up-to-date and comprehensive guidelines
- All countries reported supplemental use of other guidelines, with 19 (45.2%) using more than three
- Only one current recommendation (ultrasound before 24 weeks) was reported to be implemented in all countries
- 35 (83.3%) countries reported using at least five not-recommended antenatal care screening practices
- ▲ 21 (50%) implementing ≥10 not-recommended ANC screening practices.
- ▲ Among the most comprehensive national guidelines identified, only six (24%) had a concordance ≥75% with the reference recommendations, independently from their publication date, while the few existing cross-sectional studies highlighted large heterogeneity in the implementation of ANC practices among countries.

A 2016 publication, commissioned by EBCOG, identified that there is no consensus on the optimal approach to GDM screening in Europe. **The EBCOG recommends that more uniformity in GDM screening across Europe would lead to an opportunity for more timely diagnosis and treatment for GDM in a greater number of women.** Future research should address optimal screening strategies so that solid recommendations for GDM screening can be made to European health organizations based on screening uptake rates, maternal well-being, maternal and neonatal health outcomes, equity and cost-effectiveness.¹⁸⁸

Screening can take place for infectious disease during pregnancy,¹⁸⁹ as well as for eclampsia, GDM, and gender based violence including domestic violence and intimate partner violence (IPV). During readings of IPV, Swedish authors noted that whilst IPV prevalence was as common as risk of gestational diabetes or eclampsia, with harmful risks to health, it was not routinely screened for.

¹⁸⁶ World Health Organization (2020) Screening: When is it appropriate and how can we get it right? <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/publications/2020/screening.-when-is-it-appropriate-and-how-can-we-get-it-right-2020</u>

¹⁸⁷ Lazzerini M, Armocida B, Valente EP, Berdzuli N. Antenatal screening practices in the WHO European Region: a mixed methods study. J Glob Health. 2020 Dec;10(2):020416. doi: 10.7189/jogh.10.020416. PMID: 33312500; PMCID: PMC7719277.

¹⁸⁸ Benhalima K, Damm P, Van Assche A, Mathieu C, Devlieger R, Mahmood T, Dunne F. Screening for gestational diabetes in Europe: where do we stand and how to move forward?: A scientific paper commissioned by the European Board & College of Obstetrics and Gynaecology (EBCOG). Eur J Obstet Gynecol Reprod Biol. 2016 Jun;201:192-6. doi: 10.1016/j.ejogrb.2016.04.002. Epub 2016 Apr 11. PMID: 27105781.

¹⁸⁹ HSE Our Health Service. Screening for Infectious Disease During Pregnancy <u>https://www2.hse.ie/wellbeing/child-health/blood-tests-offered-in-pregnancy/screening-for-infectious-disease-during-pregnancy.html</u>

TWO: ACCESS TO CARE AND INFORMATION

Access to care is challenging to define, and several definitions are used across the literature. The Agency for Healthcare Research and Quality defines access to health care as having "the timely use of personal health services to achieve the best health outcomes."¹⁹⁰ *Healthy People 2020* identified access to health care as consisting of four components:¹⁹¹

- ▲ **Coverage**: facilitates entry into the healthcare system. Uninsured people are less likely to receive medical care and more likely to have poor health status.
- ▲ **Services**: Having a usual source of care is associated with adults receiving recommended screening and prevention services.
- **Timeliness**: ability to provide health care when the need is recognized.
- **Workforce**: capable, qualified, culturally competent providers.

Levesque, Harris and Russel (2013), view access to health care as the opportunity to identify healthcare needs, to seek healthcare services, to reach, to obtain or use health care services, and to actually have a need for services fulfilled. They define five dimensions of access within the 'Five A's Framework': 1) Approachability; 2) Acceptability; 3) Availability and accommodation; 4) Affordability; and 5) Appropriateness. In this same framework, the dimensions of accessibility interact with five corresponding abilities of populations: 1) Ability to perceive; 2) Ability to seek; 3) Ability to reach; 4) Ability to pay; and 5) Ability to engage.¹⁹² **This framework has been used by the European Parliament:**¹⁹³

- ▲ **Approachability** denotes communication and attitudes of providers, information available and transparency. Information about entitlements and use of maternal health care may be available to the public and accessible.
- ▲ Acceptability refers to the sphere of culture and tradition, acceptance of maternal health care, gender norms, personal values and health literacy. It also reflects the readiness of users to demand the available care services.
- ▲ **Availability** refers to the existence of services, their geographic distribution, health care professionals' numbers and specialties, the range of services and more administrative elements such as waiting lists and opening hours.
- ▲ **Affordability** relates to costs to users, whether those are formal or informal, direct or indirect. Although some vulnerable pregnant women are covered by certain health care systems, vulnerable undocumented pregnant women are in a less secure financial situation and are required to pay in many EU regions. High maternal mortality rates seem to go along with a lack of financial means for young women.
- ▲ **Appropriateness** includes the availability of equipment, infrastructure and skills of professionals, in other words what services are offered and how.

¹⁹⁰ Agency for Healthcare Quality and Research, Elements of Access to Healthcare: <u>https://www.ahrg.gov/research/findings/nhqrdr/chartbooks/access/elements.html#:-:text=Access%20to%20health%20care%20means,into%20the%20health%20care%20system.</u>

¹⁹¹ Office of Disease Prevention and Health Promotion. Access to Health Services: <u>https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health/interventions-resources/access-to-health</u>

¹⁹² Levesque JF, Harris MF, Russell G. Patient-centred access to health care: conceptualising access at the interface of health systems and populations. Int J Equity Health. 2013;12:18. Published 2013 Mar 11. doi:10.1186/1475-9276-12-18

¹⁹³ Davaki, K. (2019) Access to maternal health and midwifery for vulnerable groups in the EU <u>https://www.europarl.europa.eu/</u> <u>RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

Barriers to Access

Access to maternal health in the EU is affected by the interplay of health systems, law, policies, socio-economic factors and attitudes of health professionals and users, the absence of which can lead to barriers to access and consequently to worse health outcomes for women, in particular vulnerable women such as migrants.¹⁹⁴ In an analysis of the performance of Maternal Health care provided in Europe, Escureit et al (2015)¹⁹⁵ noted that tools and indicators largely enabled measurement of technical interventions and adverse health or medical outcomes, but that most of the indicators failed to capture the relationship between different forms and processes of care, modes of birth, and positive outcomes. This has implications for measuring access also. A need was identified for indicators which capture deliveries which do not require interventions, for example C-section, reflecting the reality that most births are low-risk, requiring few, if any, technical medical procedures.¹⁹⁶

There is evidence of disparity of access between Eastern and Western Member States. A 2017 systematic review on barriers to accessing adequate maternal care in Central and Eastern European countries,¹⁹⁷ identified that skilled professionals, up-to-date care and equipment are lacking in CEE; that distance and travel costs to facility is a barrier mostly in remote areas; that care is often expert-centred with poor attitude towards patients; that women are lacking information, autonomy and trust of medical doctors; and that a major barrier is the inability to pay the high (in)formal payments.

These reasons account for why maternal health outcomes in Central and Eastern Europe (CEE) compare unfavourably with those in Western Europe, despite macro-indicators that suggest well-designed maternal care systems.¹⁹⁸ Macro-indicators at the system level capture only capacity, funding and utilization of care and not the actual allocation of financial and human resources, the quality of care and access to it. It is these latter which are problematic in the CEE region. Availability of care is limited by outdated equipment and training curricula, and the lack of professionals and pharmaceuticals. Geographical distance to healthcare institutions, inappropriate communication of providers and waiting times are the main approachability barriers. Some mothers are unaware of the importance of care or are discouraged to utilize healthcare services because of cultural aspects. Finally, a major barrier in accessing maternal care in the CEE is the inability to pay for it.

Interview data collected from ten European countries (Austria, Denmark, Germany, Greece, Hungary, Ireland, Italy, Portugal, Spain, and Sweden), identified varying types of barriers to accessing healthcare, though these were not quantified.¹⁹⁹ Barriers to care typically related to lack of health insurance, or to being older or having more children, or to being non-European national, unmarried, or having an unplanned pregnancy, lower education or irregular income.

¹⁹⁴ Davaki, K. (2019) Access to maternal health and midwifery for vulnerable groups in the EU https://www.europarl.europa.eu/ RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf

¹⁹⁵ Escuriet, R., White, J., Beeckman, K. et al. Assessing the performance of maternity care in Europe: a critical exploration of tools and indicators. BMC Health Serv Res 15, 491 (2015). <u>https://doi.org/10.1186/s12913-015-1151-2</u>

¹⁹⁶ Escuriet, R., White, J., Beeckman, K. et al. Assessing the performance of maternity care in Europe: a critical exploration of tools and indicators. BMC Health Serv Res 15, 491 (2015). <u>https://doi.org/10.1186/s12913-015-1151-2</u>

¹⁹⁷ Elina Miteniece, Milena Pavlova, Bernd Rechel, Wim Groot, (2017). Barriers to accessing adequate maternal care in Central and Eastern European countries: A systematic literature review, Social Science & Medicine, Volume 177, Pages 1-8, ISSN 0277-9536, <u>https://doi.org/10.1016/j.socscimed.2017.01.049</u>

¹⁹⁸ Elina Miteniece, Milena Pavlova, Bernd Rechel, Wim Groot, (2017). Barriers to accessing adequate maternal care in Central and Eastern European countries: A systematic literature review, Social Science & Medicine, Volume 177, Pages 1-8, ISSN 0277-9536, <u>https://doi.org/10.1016/j.socscimed.2017.01.049</u>

¹⁹⁹ Delvaux T, Buekens P, Godin I, Boutsen M. Barriers to prenatal care in Europe. Am J Prev Med. 2001 Jul;21(1):52-9. doi: 10.1016/ s0749-3797(01)00315-4. PMID: 11418258.

A mixed-method study based in Latvia, examined barriers to accessing adequate maternal care among women, providers, and decision-makers,²⁰⁰ finding that maternal care in Latvia encounters insufficient (human) resources and inequalities in access. There is insufficient compliance with clinical guidelines and standards of care, and insufficient health literacy across population groups which also affect maternal health outcomes. The study recommends that Latvia's future reforms should address barriers to accessing adequate maternal care.

Disparities in access also manifest in terms of population characteristics, such as socioeconomic characteristics and migration status, among others. In a study of healthcare access and patterns of maternal health care utilization among poor and non-poor women living in urban areas in Portugal, associations between social status (degree of poverty in the studied groups) and fecundity (representations, tensions, practices and control of fertility) were examined. In addition, access to healthcare was assessed, particularly the association between use of maternal health care and poverty in urban areas. **The analysis confirmed the association between poverty and patterns and representations of fecundity** regarding pregnancy planning and demonstrated the existence of different distributions on several variables and the gradients of poverty.²⁰¹

Legal and policy analysis of EU Member States highlights substantial health care inequities faced by undocumented migrant women, as well as the dearth of services and free or affordable health care available to this group, classified as a vulnerable population. A report by the Centre for Reproductive Rights, entitled "Perilous Pregnancies: Barriers in Access to Affordable Maternal Health Care for Undocumented Migrant Women in the European Union," demonstrates that many EU states do not provide sufficient access to maternal health care services for all people living within their jurisdiction.²⁰² Undocumented migrant women, who are among the EU's most vulnerable and marginalized population groups, often face a lack of access to adequate antenatal care, insufficient or substandard care, and a lack of access to affordable skilled care during childbirth.

In Europe, the number of migrant women of childbearing age is rapidly increasing. This entails specific needs for maternal health services. Through a systematic review of the academic literature, interventions and policies that improve the accessibility and quality of maternal health care for migrants in the WHO European Region were assessed.²⁰³ **The review demonstrated that most migrant women have poorer maternal health outcomes than other women throughout the WHO European Region**. Identified risk factors are linked not only to pregnancy, childbirth and the postpartum period but also to events before conception. Restricted entitlement and problems with familiarity, knowledgeability, acceptability, availability and affordability jeopardize migrant women's access to maternal health care.

²⁰⁰ Elina Miteniece, Milena Pavlova, Bernd Rechel, Dace Rezeberga, Liubovè Murauskienè, Wim Groot,(2019) Barriers to accessing adequate maternal care in Latvia: A mixed-method study among women, providers and decision-makers, Health Policy, Volume 123, Issue 1,Pages 87-95, ISSN 0168-8510, <u>https://doi.org/10.1016/j.healthpol.2018.10.012</u> (https://www.sciencedirect.com/science/article/pii/S0168851018306298)

²⁰¹ Craveiro, I et al. (2013) Healthcare access and the patterns of maternal health care utilization among poor and non-poor women living in urban areas in Portugal <u>https://www.scirp.org/journal/paperinformation.aspx?paperid=40475</u>

²⁰² Centre for Reproductive Rights (2020) Perilous Pregnancies: Health Care for Undocumented Migrant Women in the EU. <u>https://</u> reproductiverights.org/unequal-access-to-maternal-health-care-in-the-eu/

²⁰³ Ines Keygnaert Olena Ivanova, Aurore Guieu, An-Sofie Van Parys, Els Leye and Kristien Roelens (2016). What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Health Evidence Network synthesis report 45 <u>https://www.euro.who.int/en/publications/</u> <u>abstracts/what-is-the-evidence-on-the-reduction-of-inequalities-in-accessibility-and-quality-of-maternal-health-care-deliveryfor-migrants-a-review-of-the-existing-evidence-in-the-who-european-region-2017</u>

Undocumented migrants report difficulties accessing healthcare.²⁰⁴ Identified barriers to healthcare were limited medical rights, arbitrariness in healthcare professionals' attitudes, fear of being reported to the police, poor language skills, lack of knowledge about the healthcare system and lack of knowledge about informal networks of healthcare professionals. These barriers generated alternative health-seeking strategies, such as self-medication, contacting doctors in home countries or borrowing health insurance cards from Danish citizens. Emergency Room nurses expressed willingness to treat all patients regardless of their migratory status, but also reported challenges such as language barriers, issues of false identification, insecurities about the correct standard procedures and not always being able to provide appropriate care.

Undocumented pregnant women constitute a vulnerable group of people who lack equal access to pregnancy care. They encounter difficulties in accessing health services, the onset of prenatal care is delayed, and they have an increased risk for infectious diseases. A Finnish study describes the use of maternal health care services and the obstetric outcomes of undocumented women in Helsinki, in addition to comparing the results with all pregnant women in Finland.²⁰⁵ The majority (91%) of the undocumented women attended public prenatal care. However, four women received no prenatal care and three women were denied access to care. Undocumented women entered prenatal care later and had fewer visits compared with all pregnant women. The majority (71%) of undocumented women received inadequate prenatal care as the number of visits was less than eight.

A 2014 publication on the right of access to care for undocumented migrants in Europe was motivated by a Spanish repeal of a law effecting a limitation on access to health care for undocumented migrants in Spain. The authors found a high degree of variability regarding healthcare entitlements for undocumented migrants across European countries, which were related to both legal restrictions and barriers to access. They based this on a narrative analysis of comparative reports on access to health care of undocumented migrants between 2009 and 2012. They reported findings on barriers to effective access to health care, and the impact of restricting access to health care on individual and collective health. This was not focused on maternal care, but the legal provisions demonstrate the environment in which migrant women are situated when it comes to maternal health care.²⁰⁶

Affordability, Entitlement and Quality

The importance of high-quality emergency obstetric and neonatal care is articulated by the WHO.²⁰⁷ A health evidence synthesis report of evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants reviewed evidence on maternal health care delivery in the WHO European Region specifically focusing on migrants.²⁰⁸ The WHO views health care, including emergency obstetric and neonatal care, as an entitlement.

²⁰⁴ Biswas, D., Kristiansen, M., Krasnik, A. et al. Access to healthcare and alternative health-seeking strategies among undocumented migrants in Denmark. BMC Public Health 11, 560 (2011). <u>https://doi.org/10.1186/1471-2458-11-560</u>

 ²⁰⁵ Tasa, J., Holmberg, V., Sainio, S. et al. Maternal health care utilization and the obstetric outcomes of undocumented women in Finland – a retrospective register-based study. BMC Pregnancy Childbirth 21, 191 (2021). <u>https://doi.org/10.1186/s12884-021-03642-7</u>

²⁰⁶ Amets Suess, Isabel Ruiz Pérez, Ainhoa Ruiz Azarola, Joan Carles March Cerdà, The right of access to health care for undocumented migrants: a revision of comparative analysis in the European context, European Journal of Public Health, Volume 24, Issue 5, October 2014, Pages 712-720, <u>https://doi.org/10.1093/eurpub/cku036</u>

²⁰⁷ WHO Europe. 2020. *Maternal and Newborn Health*. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>

²⁰⁸ Keygnaert, I. et al. (2016) What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Health Evidence Network synthesis report 45 <u>https://apps.who.int/iris/bitstream/handle/10665/326306/9789289051576-eng.pdf?sequence=1&isAllowed=y</u>

Other studies have focused on tackling inequality in affordability and entitlement of maternal health care for migrants,²⁰⁹ including evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants.²¹⁰

Regarding antenatal care utilization by country of origin in the EU, rates of late and/or inadequate antenatal care vary widely by country of birth, with varying experiences for migrant women in different countries.²¹¹ Predictors of inadequate antenatal care among migrant women were being younger than 20 years of age, multiparous, single, having poor language proficiency, an unplanned pregnancy, and no health insurance. **Other factors identified as affecting utilization of antenatal care included pregnant women's attitudes, their perceptions of maternity care provision**, differences in health expectations related to antenatal care, unawareness of the options available to migrants, poor previous encounters with the system, and cultural factors (e.g. not talking to men about pregnancy-related health). In the Netherlands, for example, the lack of information about reproductive health services and contraception, combined with problems of paying for services and fear of deportation, resulted in lacking or delayed pregnancy care, infrequent use of contraception and high abortion rates. Tellingly, the understanding of the health system is often better for migrant mothers by the time they have their second child.

Few sources provide data regarding awareness and availability of information on maternal health services among migrants in central and eastern Europe and central Asia, and some of these countries have the highest population maternal mortality ratios in the WHO European **Region**.²¹² For example, around 77-80% of all maternal deaths in Kyrgyzstan were registered in rural areas, where there are large numbers of labour migrants and where there may be limited availability of maternal health care and health education. A study of 123 migrant women in the capital of Kyrgyzstan showed that only 3% of pregnant women attended antenatal services, 82% of pregnant women suffered from different forms of anaemia and 23% had a hypertensive disorder.

According to the WHO, the exclusion of migrants from legal frameworks on access to health services often means that these populations can only access care if they have the financial means to do so. The cost of care remains a "major barrier" for migrants throughout the WHO European Region. The situation regarding financial costs for maternal health care varies widely throughout the Region. For irregular migrants, child delivery in a hospital could cost around €2500 in Sweden until 2013 but was provided free of charge in France. A Swedish 2013 health reform qualified delivery under care that cannot be deferred and so to be provided without cost; however, two years after passing the law, public authorities acknowledged that familiarity of the law among practitioners remained an issue. **Differences can be observed not only between countries but also within.** In Spain, maternal health care is provided free of cost in some regions,

²⁰⁹ World Health Organization (2016) Maternal health and migration – a new HEN report outlines evidence for tackling inequalities https://www.euro.who.int/en/health-topics/health-determinants/migration-and-health/news/news/2016/12/maternal-healthand-migration-a-new-hen-report-outlines-evidence-for-tackling-inequalities

²¹⁰ World Health Organization (2016) What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region <u>https://www.euro.who.int/en/ publications/abstracts/what-is-the-evidence-on-the-reduction-of-inequalities-in-accessibility-and-quality-of-maternal-healthcare-delivery-for-migrants-a-review-of-the-existing-evidence-in-the-who-european-region-2017</u>

Keygnaert I, Ivanova O, Guieu A, Van Parys A-S, Leye E, Roelens K. What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (Health Evidence Network (HEN) synthesis report 45). <u>https://www. euro.who.int/___data/assets/pdf_file/0003/317109/HEN-synthesis-report-45.pdf</u>

²¹² Keygnaert I, Ivanova O, Guieu A, Van Parys A-S, Leye E, Roelens K. What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (Health Evidence Network (HEN) synthesis report 45). <u>https://www. euro.who.int/______data/assets/pdf__file/0003/317109/HEN-synthesis-report-45.pdf</u>

such as Andalusia or Catalonia, while in Germany, some cities have developed specific funding mechanisms to facilitate access to care for irregular migrants. Even in countries with a good level of maternal health care, gaps in the system can occur. Lack of information and communication difficulties hamper access to maternal health care in that familiarity with and comprehensibility of the complexity of health systems and rights can be hard to achieve for migrant women. **On average, in western and southern Europe, only a quarter of migrants know their rights to access care and only half know how to navigate the health system.**

Quality and Safety, and the Right to Care

A framework for Quality Maternal and Newborn Care within the Lancet Midwifery Series articulates a shift in perspective that should guide planning, implementation, and assessment of maternal newborn health services.²¹³ Their analysis starts with what women need and want during pregnancy and childbirth. From this perspective, quality is not the last step in a chronological sequence of actions to expand coverage of clinical interventions to reduce mortality and morbidity; rather, **quality must be a priority from the start**. Managing quality includes respectful, women-centred care. The WHO Quality of Care framework for maternal and newborn health is also important.²¹⁴

A Cochrane systematic review of midwife-led care examined its contribution to the safety and quality of women's care in the domains of safety, effectiveness, woman-centeredness, and efficiency.²¹⁵ Women who received models of midwife-led care were nearly eight times more likely to be attended at birth by a known midwife, were 21% less likely to experience foetal loss before 24 weeks gestation, 19% less likely to have regional analgesia, 14% less likely to have instrumental birth, 18% less likely to have an episiotomy, and significantly more likely to have a spontaneous vaginal birth, initiate breastfeeding, and feel in control. In addition to normalizing and humanizing birth, the contribution of midwife-led care to the quality and safety of health care is substantial. The implications are that policymakers who wish to improve the quality and safety of maternal and infant care, particularly around normalizing and humanizing birth, should consider midwife-led models of care and how financing of midwife-led models of care on mothers' and infants' health and well-being, and that they are assessed in the longer postpartum period.²¹⁶

In the context of a global priority to reduce avoidable harm in maternity services, one study aimed to characterise features of safety in maternity units and to generate a plain language framework that could be used to guide learning and improvement, based on ethnographic work. **The authors identified seven features of safety in maternity units and summarised them into a framework. The features include**: (1) commitment to safety and improvement at all levels, with everyone involved; (2) technical competence, supported by formal training and informal learning; (3) teamwork, cooperation and positive working relationships; (4) constant reinforcing of safe, ethical, and respectful behaviours; (5) multiple problem-sensing systems, used as basis

²¹³ Freedman, L. and Kruk, M. (2014) Disrespect and abuse of women in childbirth: challenging the global quality and accountability agendas. The Lancet, Vol. 384. Issue 9948: 42 - 44. <u>https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)60859-X/fulltext</u>

²¹⁴ Quality of care for maternal and Newborn health: a monitoring Framework for network countries<u>https://www.who.int/docs/</u> default-source/mca-documents/qed-quality-of-care-for-maternal-and-newborn-health-a-monitoring-framework-for-networkcountries.pdf?sfvrsn=19a9f7d0_1

²¹⁵ Sandall J, Devane D, Soltani H, Hatem M, Gates S. Improving quality and safety in maternity care: the contribution of midwife-led care. J Midwifery Womens Health. 2010 May-Jun;55(3):255-61. doi: 10.1016/j.jmwh.2010.02.002. PMID: 20434086.

²¹⁶ Sandall J, Devane D, Soltani H, Hatem M, Gates S. Improving quality and safety in maternity care: the contribution of midwife-led care. J Midwifery Womens Health. 2010 May-Jun;55(3):255-61. doi: 10.1016/j.jmwh.2010.02.002. PMID: 20434086.

of action; (6) systems and processes designed for safety, and regularly reviewed and optimised; (7) effective coordination and ability to mobilise quickly.²¹⁷ Another study identified variability of anaesthetic standards of care in obstetric departments of many European Union countries.²¹⁸ Several rounds of revisions were performed by experts, to reach a common opinion concerning the topics considered central to patient safety in the obstetric setting.

Health Literacy

Health literacy includes the ability to understand health information, to use it in decision making, and to apply knowledge to everyday life.²¹⁹ The literacy levels of patients must be considered by Healthcare Professionals (HCPs) as the efficacy of communication may be limited without a mutual understanding between the HCP and their patient. To achieve this, **HCPs must communicate in a clear and concise manner and appropriate to meet the needs of their target audience.**

The antenatal period presents an ideal opportunity to support women to adopt a healthier lifestyle through diet, exercise and behavioural changes.²²⁰ A recent systematic review of available studies found that interventions addressing health literacy in pregnancy improved women's knowledge surrounding their pregnancy, including food selection and were associated with reduced levels of anxiety during the antenatal period.²²¹ HCP-facilitated, health literacy-based educational interventions, including educational talks, exercises, and counselling, lead to positive behavioural change in relation to nutrition, physical activity, dietary supplements, and prenatal care practices.²²²

Accessible, easy to understand and accurate health information empowers patients, caregivers, and their families from prevention to diagnosis through treatment and care. Health information can be used to provide information on health conditions and medical needs to patients, caregivers and their families. People who are health literate have lower mortality rates, are less likely to use healthcare services (shorter stays, fewer visits), engage in safer use of medicine, and better manage chronic conditions than are those with low health literacy.^{223,224,225,226}

Health literacy remains a salient issue throughout the EU, and certain groups—notably those of lower socioeconomic status, lower education, and older age—have disproportionately high levels

²¹⁷ Liberati EG, Tarrant C, Willars J The SCALING Authorship Group, et alSeven features of safety in maternity units: a framework based on multisite ethnography and stakeholder consultation. BMJ Quality & Safety 2021;30:444-456. <u>https://qualitysafety.bmj. com/content/30/6/444</u>

²¹⁸ Guasch, Emilia; Brogly, Nicolas; Mercier, Frederic J.; Ioscovich, Alexander; Weiniger, Carolyn F.; Lucas, Nuala[†]; Chassard, Dominique; Kranke, Peter; Whitaker, David.; Geldner, Goetz; Sabelnikovs, Olegs; de Robertis, Edoardo, European minimum standards for obstetric analgesia and anaesthesia departments, European Journal of Anaesthesiology: December 2020 - Volume 37 - Issue 12 - p 1115-1125 doi: 10.1097/EJA.0000000000001362

²¹⁹ Institute of Medicine (US) Committee on Health Literacy; Nielsen-Bohlman L, Panzer AM, Kindig DA, editors. Health Literacy: A Prescription to End Confusion. Washington (DC): National Academies Press (US); 2004. 2, What Is Health Literacy? Available from: <u>https://www.ncbi.nlm.nih.gov/books/NBK216035/</u>

²²⁰ Bagherzadeh, R., Gharibi, T., Safavi, B. et al. Pregnancy; an opportunity to return to a healthy lifestyle: a qualitative study. BMC Pregnancy Childbirth 21, 751 (2021). <u>https://doi.org/10.1186/s12884-021-04213-6</u>

²²¹ Nawabi F, Krebs F, Vennedey V, Shukri A, Lorenz L, Stock S. Health Literacy in Pregnant Women: A Systematic Review. Int J Environ Res Public Health. 2021;18(7):3847. Published 2021 Apr 6. doi:10.3390/ijerph18073847

²²² S.L. Killeen, I. Browne1,, A.A. Geraghty, S. Doyle, F.M. McAuliffe (2021). Addressing Health Literacy for Improved Outcomes: A Focus on Pregnancy. Irish Medical Journal; Vol 114; No. 3; P302 <u>http://imj.ie/wp-content/uploads/2021/03/Addressing-Health-Literacy-for-Improved-Outcomes-A-Focus-on-Pregnancy.pdf</u>

²²³ Parker RM, Jacobson KL. Emory Schools of Medicine and Public Health, National Academy of Sciences. 2012. Health Literacy. www.nationalacademies.org/hmd/-/media/Files/Activity%20Files/PublicHealth/HealthLiteracy/HealthLiteracyFactSheets_ Feb6_2012_Parker_JacobsonFinal1.pdf

²²⁴ World Health Organization. 2013. Health Literacy: The Solid Facts. Available from: <u>http://www.thehealthwell.info/node/534072</u>

²²⁵ Graham S, Brookey J. Do Patients Understand? *The Permanente Journal*. 2008;12(3):67-69.

²²⁶ CHRODIS-JA. (2014). *MyDiabet.es Pilot Research Project Results*. <u>http://chrodis.eu/wp-content/uploads/2014/07/mydiabetes-</u> survey-report_final-draft.pdf.

of insufficient or limited health literacy.^{227,228} Women are vital health managers and decisionmakers. Women are the majority of health professionals and caregivers. Women are also patients, disproportionately so during their older years, as well as family members. Therefore, women are important targets of health literacy information.²²⁹ Poor health literacy has a detrimental effect on care and outcomes not only on women but also on their children.²³⁰ As women obtain and use health information in a different manner than do men, health information must be customised to meet the unique needs of women and men, to support them in their care decisions through self-management, goal orientation and shared decision-making.²³¹ Health messaging must be tailored to compete with advertising that targets women.

Comparative results of the European Health Literacy Survey, Eurobarometer, conducted in eight countries of the European Union (Austria, Bulgaria, Germany, Greece, Ireland, the Netherlands, Poland and Spain) found that in spite of the growing attention for the concept among European health policymakers, researchers and practitioners, **information about the status of health literacy in Europe remains scarce.**²³²

In a systematic literature review of Migrant Health Literacy in the EU, two studies addressed maternal care. The first study examined ethnicity-related factors contributing to sub-standard maternity care and the effects of severe maternal morbidity among migrant women from Turkey, Morocco, Suriname, Eastern Europe, the Middle East, Asia, sub-Saharan African countries and native Dutch women.²³³ Migrant women reported inadequate care, delayed responses from healthcare providers and further delays in receiving health information regarding diagnoses and available treatment. In addition, the participants had difficulty identifying medically significant complications, communicating their concerns effectively and taking an active role in their healthcare. The authors recommend that interactions between maternal health professionals and patients can be improved by increased sensitivity to social factors affecting migrant women's health. The second study looked at the experiences and perspectives of Dutch midwives with clients born in non-Western countries.²³⁴ Findings revealed a variety of difficulties when caring for migrant women including communication barriers, linguistic issues, suboptimal health literacy levels, socioeconomic problems, lack of knowledge of the maternity care system in the Netherlands and a strong preference for physicians over midwives. Moreover, native Dutch midwives observed a relationship between low health literacy and a decreased ability to understand and use health information and the utilisation of maternity care by some patients.

²²⁷ Sørensen K, Pelikan JM, Röthlin F, et al. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). The European Journal of Public Health. 2015;25(6):1053-1058. doi:10.1093/eurpub/ckv043.

²²⁸ CHRODIS-JA. (2014). *MyDiabet.es Pilot Research Project Results*. http://chrodis.eu/wp-content/uploads/2014/07/mydiabetessurvey-report_final-draft.pdf.

²²⁹ European Institute of Women's Health. (2018). EU Manifesto for Women's Health Background Briefing. <u>https://eurohealth.ie/our-manifesto-for-womens-health-2018-a-background-briefing</u>.

²³⁰ Corrarino, Jane E. (2013). "Health literacy and women's health: challenges and opportunities." *Journal of midwifery & women's health* 58.3:257-264.

²³¹ Bidmon, Sonja, and Ralf Terlutter. (2015). "Gender differences in searching for health information on the internet and the virtual patient-physician relationship in Germany: exploratory results on how men and women differ and why." Journal of Medical Internet Research 17.6: e156.

²³² Sørensen K, Pelikan JM, Röthlin F, et al. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). The European Journal of Public Health. 2015;25(6):1053-1058. doi:10.1093/eurpub/ckv043

²³³ Jonkers M, Richters A, Zwart J, Öry F, van Roosmalen J. Severe maternal morbidity among immigrant women in the Netherlands: patients' perspectives. Reprod Health Matters. 2011 May;19(37):144-53. doi: 10.1016/S0968-8080(11)37556-8. PMID: 21555095

²³⁴ Boerleider, A.W., Francke, A.L., Manniën, J., Wiegers, T.A., Devillé, W. (2013). "A mixture of positive and negative feelings": A qualitative study of primary care midwives' experiences with non-western clients living in the Netherlands, International Journal of Nursing Studies, 50; 12; 1658-1666, <u>https://doi.org/10.1016/j.ijnurstu.2013.04.009</u>

The HLS-EU-Q constructed four levels of health literacy: insufficient, problematic, sufficient and excellent.²³⁵ At least 1 in 10 (12%) respondents showed insufficient health literacy and almost 1 in 2 (47%) had limited (insufficient or problematic) health literacy. However, the distribution of levels differed substantially across countries (29-62%). **Subgroups within the population, defined by financial deprivation, low social status, low education or old age, had higher proportions of people with limited health literacy, suggesting the presence of a social gradient must be taken into account when developing public health strategies to improve equitable health literacy in Europe**.

Health literacy plays a crucial role during pregnancy, as the mother's health behaviour influences both her own health and that of her child. A systematic review aimed to assess health literacy levels in pregnant women; the association with outcomes during pregnancy; and the existence of effective interventions.²³⁶ From 14 studies, **limited health literacy was associated with unhealthy behaviours during pregnancy**. Mixed health literacy findings were attributed to the recruitment site, the number of participants and the measurement tool used. Quality assessment revealed the quality of the included studies was moderate to good. **The review demonstrated that randomized controlled trials and interventions to improve health literacy in pregnant women are rare or do not exist.** This is crucial in the light of the mixed health literacy levels found among pregnant women. **Healthcare providers play a key role, as pregnant women with limited health literacy rely on them as sources of health information**. Within this review, the majority of studies were situated in North America (both Canada and the United States), but 4 studies were situated in the European Union: Ireland (n = 1), the Netherlands (n=2), and a range of countries including all European, the United States and countries from Central and Southern America.

European statistics (Table 1) **show that incomprehension of healthcare information is common across a variety of health services**, **affecting almost half of individuals**. Incomprehension may impact the ability of some patients to make informed decisions about their health and follow health advice. In many countries, literacy difficulties are common, affecting anywhere from one in ten to one in five individuals. Data is sourced from Killeen et al.²³⁷ and below table sourced in text at OECD.²³⁸

Table 1. Health Literacy in the European Union

Health Literacy Staticstics
47% of adults find reading about health information challenging
41% of adults cannot weigh up advantages and disadvantages when comparing medical treatments
37% would not know when to seek clarification from a second doctor
35% find it challenging to interpret information on a food label
32% would not know how to seek health information on how to manage their mental health

Date from Moreira, 2018

²³⁵ Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, Fullam J, Kondilis B, Agrafiotis D, Uiters E, Falcon M, Mensing M, Tchamov K, van den Broucke S, Brand H; HLS-EU Consortium. Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU). Eur J Public Health. 2015 Dec;25(6):1053-8. doi: 10.1093/eurpub/ckv043

²³⁶ Nawabi F, Krebs F, Vennedey V, Shukri A, Lorenz L, Stock S. Health Literacy in Pregnant Women: A Systematic Review. Int J Environ Res Public Health. 2021 Apr 6;18(7):3847. doi: 10.3390/ijerph18073847. PMID: 33917631; PMCID: PMC8038834.

²³⁷ S.L. Killeen, I. Browne1,, A.A. Geraghty, S. Doyle, F.M. McAuliffe (2021). Addressing Health Literacy for Improved Outcomes: A Focus on Pregnancy. Irish Medical Journal; Vol 114; No. 3; P302 <u>http://imj.ie/wp-content/uploads/2021/03/Addressing-Health-Literacy-for-Improved-Outcomes-A-Focus-on-Pregnancy.pdf</u>

²³⁸ S.L. Killeen, I. Browne1,, A.A. Geraghty, S. Doyle, F.M. McAuliffe (2021). Addressing Health Literacy for Improved Outcomes: A Focus on Pregnancy. Irish Medical Journal; Vol 114; No. 3; P302

THREE: BIRTH: LABOUR AND DELIVERY

There is no defined standard of care for labour and delivery in the European Union. Differences in modes of delivery are evident between EU countries, for example, in the use of medical interventions such as caesarean sections. There is no common understanding of the reasons behind such variation in care and birth outcomes across the EU. This is due in part to the absence of standard EU-wide measures for labour, delivery, and outcomes.²³⁹

Context of Care

The most recent EU-wide data reports lower rates of stillbirth as well as neonatal, infant and maternal death when compared to other high-income countries outside Europe.²⁴⁰ However, the health and care of pregnant women and babies are highly variable between EU countries, including significant changes - increases as well as decreases - in findings between the 2010 and 2015 European Perinatal Health Reports. Disparities present an opportunity to identify and understand reasons for variations, as well as to learn from countries who are leading with regards to standards of care.

In 2019, 4.2 million births occurred across the EU.²⁴¹ An estimated further 2 million have a pregnancy that does not end in birth, including spontaneous and induced abortions, and molar and ectopic pregnancies.²⁴² Molar pregnancies relate to adverse fertilization and ectopic pregnancies to adverse implantation. The median multiple pregnancy rate in Europe is 16.7 per 1000 women delivering a live or stillbirth. Birth rates vary across Europe, with highs of over 19 births per 1000 women in Ireland, Germany, Slovenia, Spain and Cyprus, to less than 14 per 1000 in Romania, Slovakia, Poland, Greece, Finland, and Lithuania.²⁴³

Maternal deaths in the EU are rare. However, up to half of maternal deaths are associated with poor quality or substandard care, and groups such as migrant women experience greater morbidity and mortality. Population-based social and environmental factors such as age, low and high BMI, socioeconomic status, immigrant status, stress, air pollution;^{244,245} as well as clinical factors such as obstetric history, infection, inflammation, and chronic disease such as diabetes,²⁴⁶ impact on the mode of delivery and increase the risk of complications and loss during labour and delivery. As stated in the 2018 European Perinatal Health Report, this is cause for concern, as epidemiological trends across the EU indicate that many risk factors *"are becoming more common and have the potential to stop or to reverse downward trends in mortality."*²⁴⁷ The section of this report on vulnerable social groups will cover these trends in more detail.

²³⁹ Escuriet, R., White, J., Beeckman, K. et al. Assessing the performance of maternity care in Europe: a critical exploration of tools and indicators. BMC Health Serv Res 15, 491 (2015). <u>https://doi.org/10.1186/s12913-015-1151-2</u>

²⁴⁰ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁴¹ Eurostat Fertility Statistics: <u>https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fertility_statistics</u> [Accessed 17.11.23]

²⁴² European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁴³ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁴⁴ Delnord M, Blondel B, Zeitlin J. What contributes to disparities in the preterm birth rate in European countries? Curr Opin Obstet Gynecol. 2015;27(2):133-142.

²⁴⁵ Delnord M, Mortensen L, Hindori-Mohangoo AD, et al. International variations in the gestational age distribution of births: an ecological study in 34 high-income countries. Eur J Public Health. 2018;28(2):303-309

²⁴⁶ Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. Lancet. 2008;371(9606):75-84.

²⁴⁷ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

Labour

A clear understanding of what constitutes normal labour onset and progress is essential to safely monitor labour and childbirth in any setting. However, global consensus is lacking around the definitions of the onset, and duration, of the different phases and stages of "normal" labour.²⁴⁸ Given this variation, it is difficult to compare labour experiences in statistics across Europe. The type of care received during labour can be influenced by the stage of labour at admission, as well as how stages of labour are defined and monitored.^{249,250} **One study found that the interaction of geography, social circumstances and health system capacity plays a role in the decision-making between an early or delayed admission.**^{251,252} A recent review²⁵³ assessed overall labour duration and progression for women, as well as methods for the identification of women at risk of birth complications. Findings revealed that cervical dilation may not be an appropriate indicator to define labour arrest, and may lead to unnecessary labour interventions;^{254,255} natural labour processes may differ among women so that speed of labour does not guarantee similar outcomes; and interventions to accelerate labour should not be used where there is evidence of progression and a capacity to safely monitor the health of the mother and the baby.²⁵⁶

Optimising maternal care in the EU would benefit from further progressing understanding of how women experience labour.²⁵⁷ The onset and progress of labour is a complex interaction of neuro-hormonal, biophysical, psychological and emotional factors. The stages of labour, as well as the signs and symptoms of labour onset, remain ill-defined. Hundley et al.'s (2020) review highlights that optimal care, particularly at the initiation of labour, should support a balance between "women's needs and right to health care provider advice and support with the risks of early hospital admission, ensuring that women and their foetuses have access to appropriate care as and when they need it, without being exposed to the cascade of unnecessary interventions." In order to support best practice for care during labour, further research is required to explain the processes behind labour initiation as well as to define stages of labour. Lines of research inquiry should be informed by enhancing our understanding of women's experiences during early labour, as well as outcomes of labour.

Models of Care

The vast majority of births are uncomplicated and are low risk. However, in an attempt to reduce the burden of mortality and morbidity associated with childbirth, labour and delivery has become

²⁴⁸ WHO recommendations: intrapartum care for a positive childbirth experience. Geneva: World Health Organization; 2018. Licence: CC BY-NC-SA 3.0 IGO. <u>https://apps.who.int/iris/bitstream/handle/10665/260178/9789241550215-eng.pdf</u>

²⁴⁹ Hundley V, Downe S, Buckley SJ. The initiation of labour at term gestation: physiology and practice implications. BestPractRes Clin Obstet Gynaecol 2020;67:4e18 <u>https://pubmed.ncbi.nlm.nih.gov/32220530/c</u>

²⁵⁰ Abalos E, Chamillard M, Díaz V, Pasquale J, Souza JP. Progression of the first stage of spontaneous labour. BestPractResClin Obstet Gynaecol 2020;67:19e32. <u>https://pubmed.ncbi.nlm.nih.gov/32247770/</u>

²⁵¹ Optimal intrapartum care in the twenty-first century. Preface. Best Practice & research clinical obstetrics and gynaecology (2020) <u>https://pubmed.ncbi.nlm.nih.gov/32698995/</u>

²⁵² Hundley V, Downe S, Buckley SJ. The initiation of labour at term gestation: physiology and practice implications. BestPractRes Clin Obstet Gynaecol 2020;67:4e18 <u>https://pubmed.ncbi.nlm.nih.gov/32220530/</u>

 ²⁵³ Abalos E, Chamillard M, Díaz V, Pasquale J, Souza JP. Progression of the first stage of spontaneous labour. BestPractResClin Obstet Gynaecol 2020;67:19e32. <u>https://pubmed.ncbi.nlm.nih.gov/32247770/</u>
 ²⁵⁴ M. Bonet, O.T. Oladano, J.P. Souza, A.M. Gülmazardu.

 ²⁵⁴ M. Bonet, O.T. Oladapo, J.P. Souza, A.M. Gülmezoglu
 Diagnostic accuracy of the partograph alert and action lines to predict adverse birth outcomes: a systematic review BJOG, 126 (13) (2019), pp. 1524-1533 <u>https://pubmed.ncbi.nlm.nih.gov/31334912/</u>

²⁵⁵ WHO recommendations Intrapartum care for a positive childbirth experience. WHO guidelines approved by the guidelines review committee World Health Organization, Geneva, Switzerland (2018) <u>https://apps.who.int/iris/bitstream/handle/10665/272447/</u> WHO-RHR-18.12-eng.pdf

²⁵⁶ Abalos E, Chamillard M, Díaz V, Pasquale J, Souza JP. Progression of the first stage of spontaneous labour. BestPractResClin Obstet Gynaecol 2020;67:19e32. <u>https://pubmed.ncbi.nlm.nih.gov/32247770/</u>

²⁵⁷ Hundley V, Downe S, Buckley SJ. The initiation of labour at term gestation: physiology and practice implications. BestPractRes Clin Obstet Gynaecol 2020;67:4e18 <u>https://pubmed.ncbi.nlm.nih.gov/32220530/</u>

increasingly medicalised and surgical.²⁵⁸ The prevailing model of care^{259,260} used for labour and delivery across the EU is doctor-led, in hospital-based settings. The most notable exception to this is the Netherlands,²⁶¹ where midwife-led care is used, and the proportion of home-births is significantly higher versus other Member States and births conducted using interventions are comparatively lower.

Begley *et al* (2011) in the Irish context identified a number of aspects of maternal satisfaction as part of a randomised trial comparing midwife-led and consultant-led care. Statistically significant higher mean satisfaction scores were identified for the statements regarding women's feeling that they were with people who cared about them, their confidence in the staff and how satisfied they were with care after birth. **Public policy has increasingly placed emphasis on patientcentred care. Attributes associated with person-centred care include kindness, users' needs and preferences, access to care and increased personal control over their own health. In terms of models of care, there is some consistency in the findings on models of care provided.**

The WHO Labour Care Guide is a new tool, which puts the WHO recommendations on intrapartum care into practice.²⁶² This global model of intrapartum care helps skilled health personnel to provide woman-centred, safe and effective care. Health personnel are recommended to regularly assess the well-being of the woman and her baby; record their observations; check for signs that breach thresholds for health and well-being as labour progresses; and plan what care may be required - most importantly - in consultation with the woman. Furthermore, the 2020 WHO Labour Care Guide emphasises the use of a woman-centred approach to care as a means to both recognise the autonomy and rights of women to place their values and preferences as the centre of their own care; as well as to optimise positive childbirth experiences and outcomes.²⁶³ Recommendations from this labour care guide are intended to inform the development of relevant national- and local-level health policies and clinical protocols.

At present, the WHO labour guide is most relevant to healthy non-high-risk pregnancies. However, whilst the duality of high intervention rates as well as variation in mode of delivery used across the EU indicates a need to investigate and understand the figures reported, this guide speaks to **the need to address increasing calls for maternal care which approach birth as a normal physiological event, and which centres the women's experiences and needs during birth**. In their 2018 WHO recommendations on intrapartum care for a positive childbirth experience, a fundamental element for implementation of recommendations is approaching childbirth in a manner which treats every birth as a unique event.²⁶⁴

²⁵⁸ Reibel, T. (2004). Normal birth: A thing of the past or the new future for primary health care'. Primary Health Care Research & Development, 5(4), 329-337. doi:10.1191/1463423604pc223oa

²⁵⁹ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland "predominant model is hospital-based consultant-led care; can choose between public, semi-private or private care; some hospitals have outreach antenatal and postnatal care clinics; small number of independent community midwives providing care for home births (0.2% of total births in 2009); small number of midwife-led units; gynaecology services generally provided in tertiary care" <u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.</u> pdf

²⁶¹ National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland. <u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.pdf</u> The Netherlands: "midwives are autonomous and are primary care; 41% of women remain in primary care throughout pregnancy, birth and postpartum period; approximately 30% of births take place at home; GPs involved in primary care for low-risk women and obstetricians in secondary care for higher risk women; gynaecology services generally provided in tertiary care units

²⁶² WHO (2021) WHO Labour Care Guide: User's Manual <u>https://www.who.int/publications/i/item/9789240017566</u>

²⁶³ WHO (2021) WHO Labour Care Guide: User's Manual <u>https://www.who.int/publications/i/item/9789240017566</u>

²⁶⁴ WHO (2020) Monitoring childbirth in a new era for maternal health <u>https://www.who.int/news/item/15-12-2020-monitoring-childbirth-in-a-new-era-for-maternal-health</u>
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WHO recommendations Intrapartum care for a positive childbirth experience. Transforming care of women and babies for improved health and well-being (2020) https://apps.who.int/iris/bitstream/handle/10665/272447/WHO-RHR-18.12-eng.pdf?ua=1

The European Foundation for the Care of Newborn Infants has published *European Standards for Care of Newborn Infants*.²⁶⁵ It does this to address disparities in the care of preterm and ill babies. Its strategy is to provide European reference standards for this health care area. An established network of professionals from the varying Member States **coordinate information on topics such as birth and transfer; care procedures; data collection and documentation.**

Globally, labour management continues to evolve to reduce associated maternal and perinatal mortality and morbidity. Many more women are now giving birth in a health facility than in previous decades. The price for this global shift should not be over-medicalisation of birth and poorer quality of care leading to stagnancy in countries' progress towards maternal and newborn targets of the 2030 sustainable development agenda. Changing the current trajectory would require the provision of evidence-based, individualised labour interventions which translate 'women-centred' and 'respect' from theoretical dimensions of quality care into practical implementation, while ensuring that childbirth events leave a positive impact on women and their families.

Mode of Delivery

Vast differences in the mode of delivery across Europe have persisted since 2010.^{266,267} The median caesarean section rate is 25.7% across Europe,²⁶⁸ and one quarter of countries have rates below 21%. Iceland, Finland, Norway, and the Netherlands have the lowest rates of under 18%, while Greece, Italy, Hungary, Poland, Bulgaria, Romania, and Cyprus had rates over 35%. Whilst caesarean birth rates increased by an average of 4% across the EU from 2010 to 2015, the greatest increases, from 17% to 27%, were reported in Scotland, Hungary, Poland and Romania. Declines in caesarean birth rates were reported in Lithuania, Latvia, Portugal, Estonia, Italy, and Norway.²⁶⁸ However it should be noted that countries in the EU differ in the classification of caesarean section with regards at what point they were undertaken in relation to labour (pre-, post- or during).

The high proportions of births across the EU which have used a medical and/or surgical intervention, as well as variation between EU Member States,²⁷⁰ calls into question the necessity of interventions in all instances. A study of one area in France, found that one-third of caesarean sections which took place were considered 'inappropriate', reported to be due - in part - to maternal preference (12%) and provider preference (22%).²⁷¹ Whilst causes behind the increase in caesarean sections in certain geographic locations internationally is not fully understood, some evidence points to a complex decision-making mechanism in which mode of delivery in Europe is influenced – beyond medical need – by health systems factors, including

²⁶⁵ European Standards of Care for Newborn Health <u>https://www.efcni.org/activities/projects-2/escnh/</u>

²⁶⁶ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁶⁷ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

²⁶⁸ WHO, 2021. Cesarean section rates continue to rise, amid growing inequalities in access. <u>https://www.who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access</u>

²⁶⁹ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁷⁰ Peristat, 2018. <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

²⁷¹ Vendittelli et al (2014) in National and International review of literature on models of care across selected jurisdictions to inform the developmentofaNationalStrategyforMaternityServicesinIreland.<u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.</u> pdf

methods of payments.²⁷² For example, an Irish study from 2011 reported higher rates are seen in the private sector.²⁷³ Further influence may be exerted by "*health care providers, societies, and even fashion and media*". However, evidence is mixed as to the extent of the impact of women's choice and preference on Caesarean rates²⁷⁴ with some studies citing women's choices as a cause of Caesarean section despite other findings indicating that "*only a minority of women in a wide range of countries have expressed a preference for Caesarean section*".²⁷⁵ Further studies report that some women would have preferred a vaginal delivery over a Caesarean section.²⁷⁶

Differences in care across Europe remain when examining rates for specific subgroups, such as for babies born by breech presentation, which ranged from caesarean birth rates of 64.3% to 100% (median rate of 89%). 25% or more of breech babies were born vaginally only in a small number of countries (Norway, Latvia, Finland, and France). Instrumental birth rates (assisted births with forceps, etc.) across Europe also varied widely. The median instrumental birth rate was 7.2%, ranging from below 3.5% in a quarter of countries such as Romania, Croatia, Lithuania, Slovakia, and Latvia to over 10.9% in another quarter of countries, for example in France, Spain, and Ireland.²⁷⁷

Although limited by a lack of data to comment on the association between stillbirths, maternal and perinatal morbidity, paediatric outcomes and psychological or social well-being, the WHO Statement on Caesarean Section Rates concluded that *"CS rates higher than 10% were not associated with reductions in maternal and newborn mortality rates."*²⁷⁸ Where it is not medically required, caesarean section has not been shown to have any benefits. Furthermore, **as a surgical procedure, caesarean section itself is associated with risk during the delivery as well as having implications for future pregnancies.**

Although caesarean section rates across the EU are systematically higher than 10%, rather than striving to reach this specific rate, the WHO recommends the focus should instead be placed on collecting the data required to support evidence-based decision-making for appropriate care.²⁷⁹

²⁷⁴ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

²⁷⁵ Kingdon C, Neilson J, Singleton V, Gyte G, Hart A, Gabbay M, et al. Choice and birth method: mixed method study of caesarean delivery for maternal request. BJOG 2009;116:886–95. <u>https://pubmed.ncbi.nlm.nih.gov/19385961/</u>
 McCourt C, Weaver J, Statham H, Beake S, Gamble J, Creedy D. Elective caesarean section and decision making: a critical review of the literature. Birth 2007;34:65–79. <u>https://pubmed.ncbi.nlm.nih.gov/17324181/</u>

²⁷² Bertollini R, Di Lallo D, Spadea T, Perucci C. Caesarean section rates in Italy by payment mode: an analysis based on birth certificates. Am J Public Health 1992;82:257-61. <u>https://pubmed.ncbi.nlm.nih.gov/1739159/</u>Coulm B, Le Ray C, Lelong N, Drewniak N, Zeitlin J. Obstetric interventions for low-risk pregnant women in France: do maternity unit characteristics make a difference? Birth 2012;39:183-91. Coulm B, Le Ray C, Lelong N, Drewniak N, Zeitlin J. Obstetric interventions for low-risk pregnant women in France: do maternity unit characteristics make a difference? Birth 2012;39:183-91. Coulm B, Le Ray C, Lelong N, Drewniak N, Zeitlin J. Obstetric interventions for low-risk pregnant women in France: do maternity unit characteristics make a difference? Birth 2012;39:183-91. Grytten, J., Monkerud, L., Hagen, T.P. et al. The impact of hospital revenue on the increase in Caesarean sections in Norway. A

panel data analysis of hospitals 1976-2005. BMC Health Serv Res 11, 267 (2011). <u>https://doi.org/10.1186/1472-6963-11-267</u> ²⁷³ Turner (2011b) in National and International review of literature on models of care across selected jurisdictions to inform the developmentofaNationalStrategyforMaternityServicesinIreland<u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.</u> <u>pdf</u>

Mazzoni A, Althabe F, Liu NH, Bonotti AM, Gibbons L, Sanchez AJ, et al. Women's preference for caesarean section: a systematic review and meta-analysis of observational studies. BJOG 2011;118:391–9. <u>https://pubmed.ncbi.nlm.nih.gov/21134103/</u>

²⁷⁶ Donati S, Grandolfo ME, Andreozzi S. Do Italian mothers prefer Cesarean Delivery? Birth 2003;30:89-93. <u>https://pubmed.ncbi.</u> nlm.nih.gov/12752165/

Dweik D, Girasek E, Meszaros G, ToĐreki A, Kereszturi A, Pal A. Non- medical determinants of cesarean section in a medically dominated maternity system. Acta Obstet Gynecol Scand 2014;93:1025–33. <u>https://pubmed.ncbi.nlm.nih.gov/25066090/</u> Coulm B, Blondel B, Alexander S, Boulvain M, Le Ray C. Potential avoidability of planned cesarean sections in a French national database. Acta Obstet Gynecol Scand 2014;93:905–12. <u>https://pubmed.ncbi.nlm.nih.gov/24910420/</u>

²⁷⁷ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁷⁸ Betran AP, Torloni MR, Zhang JJ, et al. WHO Statement on Caesarean Section Rates. BJOG. 2016;123(5):667-70. doi: 10.1111/1471-0528.13526. <u>https://obgyn.onlinelibrary.wiley.com/doi/10.1111/1471-0528.13526</u>

²⁷⁹ Betran AP, Torloni MR, Zhang JJ, et al. WHO Statement on Caesarean Section Rates. BJOG. 2016;123(5):667-70. doi: 10.1111/1471-0528.13526. <u>https://obgyn.onlinelibrary.wiley.com/doi/10.1111/1471-0528.13526</u>

Particularly as a caesarean section, when needed, can prevent perinatal asphyxia, stillbirth, uterine rupture or obstetric fistula, and can reduce maternal and perinatal mortality and morbidity overall.²⁸⁰

Complications and Loss

Maternal and child health mortality and morbidity act as a litmus test for the strength and quality of care provided within health systems.²⁸¹ As of 2015, rates of stillbirth, neonatal, infant, and maternal death were lower in Europe than in many other high-income countries outside Europe.²⁸² Although the majority of births are a 'normal' and positive health experience; **labour** and childbirth is still a high-risk event for women and their children.

At the international level, labour, childbirth or the immediate postpartum period alone are attributed with over a third of maternal deaths,^{283,284} as well as approximately 1 in 2 stillbirths and 1 in 4 neonatal deaths.²⁸⁵ **There were almost 1,800 maternal deaths in Europe in 2015**.²⁸⁶ The 2015 EU maternal mortality ratio of 10 deaths in 100,000 lives was approximately 50 times lower than the Maternal Mortality Rate in low income countries.²⁸⁷ While most EU countries reported rates from 5 to 11.9 per 100,000 births, country comparisons indicate that the outcomes of care vary amongst countries within the EU. The lowest rates – below 5 per 100,000 – were found in Belgium, Greece, Poland, Germany, Spain, Slovakia, Switzerland and the Nordic Countries; whereas the highest rates – above 12 per 100,000 – were reported by Hungary, Romania and Latvia.²⁸⁸

Major complications which contribute to almost 75% of all maternal deaths worldwide include pre-eclampsia and eclampsia, unsafe abortion, complications during delivery, as well as severe bleeding and infections, both most often occurring after childbirth.²⁸⁹ **While maternal deaths in the EU remain lower than in many other high income countries, substandard or poor quality care is associated with up to half of maternal deaths.**^{290,291} An EU-wide study from 2003-2004 which defined severe acute maternal morbidity as including eclampsia, obstetric haemorrhage requiring surgery and blood transfusion, and ICU admission as one of their main outcome

²⁸⁰ Ye J, Betran AP, Torloni MR, Mikolajczyk RT, Gulmezoglu A, Zhang J. Association between caesarean section and maternal and neonatal mortality: a worldwide population-based ecologic study. BJOG 2015; doi: 10.1111/1471-0528.13592. <u>https://pubmed.ncbi.nlm.nih.gov/26331389/</u>

²⁸¹ Wildman K, Bouvier-Colle MH, Group M. Maternal mortality as an indicator of obstetric care in Europe. BJOG. 2004;111(2):164-9. <u>https://pubmed.ncbi.nlm.nih.gov/14723755/</u>

²⁸² European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁸³ Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR, et al. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2014;384(9947):980–1004. <u>https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4255481/</u>

²⁸⁴ Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323-33. <u>https://pubmed.ncbi.nlm.nih.gov/25103301/</u>

Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, et al. Stillbirths: rates, risk factors, and acceleration towards 2030. Lancet. 2016;387(10018):587-603. <u>https://pubmed.ncbi.nlm.nih.gov/26794078/</u>

²⁸⁶ European Parliament (2019) Access to maternal health and midwifery for vulnerable groups in the EU. Directorate-General for Internal Policies, Policies Department C: Citizens' Rights and Constitutional Affairs, Gender Equality, European Parliament, Brussels <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

²⁸⁷ WPL (2018) Improving Maternal Healthcare for Vulnerable Women in EU28. What can you do? Women Political Leaders Global Forum, p.23. European Parliament (2019) Access to maternal health and midwifery for vulnerable groups in the EU. Directorate-General for Internal Policies, Policies Department C: Citizens' Rights and Constitutional Affairs, Gender Equality, European Parliament, Brussels <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

²⁸⁸ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁸⁹ Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels JD, et al. Global Causes of Maternal Death: A WHO Systematic Analysis. Lancet Global Health. 2014;2(6): e323-e333.

²⁹⁰ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁹¹ Bouvier-Colle MH, Mohangoo AD, Gissler M, et al. What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. BJOG 2012;119(7):880-9; discussion 90. doi: 10.1111/j.1471-0528.2012.03330.x https://pubmed.ncbi.nlm.nih.gov/22571748/

measures indicated that an estimated 0.2 to 1.6 women per 1000 experience morbidity.²⁹² The main contributory factors to perinatal death include congenital anomalies, very preterm birth, and foetal growth restriction.

Strong associations have been highlighted between adverse maternal and child health events, and high-risk pregnancies including obstetric challenges such as premature rupture of membranes and very preterm birth,^{293,294} previous obstetric history, pregnancy related medical conditions²⁹⁵ such as pre-eclampsia, eclampsia and GDM; problems with the infant²⁹⁶ including congenital abnormalities as well as behavioural factors such as smoking.²⁹⁷

Between the 2010 and 2015 EURO-PERISTAT reports, trends toward later age at childbirth (mothers aged 35 years or older) increased across Europe by 16%, with the largest increases in Cyprus, Hungary, the Czech Republic & Portugal. In Bulgaria, Romania, and Poland women having babies at 35 or older is below 15%, rising to over 29% of women in Portugal, Greece, Ireland, Italy and Spain (median of 20.8% of women across the EU).^{298,299} With the exception of greater than 6% in Slovakia, Hungary, Romania and Bulgaria, teenage pregnancy is experiencing a downward trend, with less than 3% of women under 20 years of age at the birth of their child across 21 European countries.³⁰⁰

In 2018, research examined the effect of advanced age on maternal and neonatal outcomes of **placenta previa**, finding that age did not play a role.³⁰¹ In a register based cohort study, using data from three Finnish health registries comprising 283,324 women and their new-borns, evidence demonstrated that the risk of adverse maternal and neonatal outcomes for women with placenta previa (a complication where the placenta partially or totally covers the mother's cervix) was not substantially affected by maternal age if their different risk profiles were taken into account.

As discussed above, the exponential increase in prevalence of women who are underweight, overweight, or obese across the EU is a cause for concern during labour and delivery. GDM and

gestational hypertension is twice as common in pregnant women who are obese, making them three times more at risk of developing preeclampsia than women of normal weight and as such

²⁹² Bouvier-Colle MH, Mohangoo AD, Gissler M, et al. What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. BJOG 2012;119(7):880-9; discussion 90. doi: 10.1111/j.1471-0528.2012.03330.x https://pubmed.ncbi.nlm.nih.gov/22571748/

²⁹³ Talic, A., Kurjak, A., Ahmed, B., Stanojevic, M., Predojevic, M., Kadic, A.S. and Di Renzo, G.C. (2011) 'The potential of 4D sonography in the assessment of fetal behavior in high-risk pregnancies', Journal of Maternal-Fetal and Neonatal Medicine, Vol. 24, No.7, pp. 948-54. <u>https://pubmed.ncbi.nlm.nih.gov/21142753/</u>

²⁹⁴ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

²⁹⁵ Talic, A., Kurjak, A., Ahmed, B., Stanojevic, M., Predojevic, M., Kadic, A.S. and Di Renzo, G.C. (2011) 'The potential of 4D sonography in the assessment of fetal behavior in high-risk pregnancies', Journal of Maternal-Fetal and Neonatal Medicine, Vol. 24, No.7, pp. 948-54. <u>https://pubmed.ncbi.nlm.nih.gov/21142753/</u>

²⁹⁶ Talic, A., Kurjak, A., Ahmed, B., Stanojevic, M., Predojevic, M., Kadic, A.S. and Di Renzo, G.C. (2011) 'The potential of 4D sonography in the assessment of fetal behavior in high-risk pregnancies', Journal of Maternal-Fetal and Neonatal Medicine, Vol. 24, No.7, pp. 948-54. <u>https://pubmed.ncbi.nlm.nih.gov/21142753/</u>

²⁹⁷ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁹⁸ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

²⁹⁹ National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland. <u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.pdf</u>

³⁰⁰ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

³⁰¹ The effect of advanced maternal age on maternal and neonatal outcomes of placenta previa: A register-based cohort study. Roustaei, Zahra et al. European Journal of Obstetrics and Gynecology and Reproductive Biology, Volume 227, 1 – 7 (2018) https:// www.ejog.org/article/S0301-2115(18)30226-4/fulltext

at greater risks of experiencing adverse outcomes at birth.³⁰² The increasing risk of pregnancy complications, perinatal and infant outcomes associated with obesity and pregnancy may explain in part why overweight and obese women are twice more likely to deliver by caesarean,³⁰³ but less effective uterine contractions may also play a role.³⁰⁴

Countries such as Ireland, where prevalence of alcohol use and smoking during pregnancy are high (almost 1 in 5 women smoked at some point during their pregnancy in Ireland)³⁰⁵ need to pay particular attention to the increased risk this may have on complications for mothers and their babies during birth.

Although at the EU level, mortality associated with complications from pregnancy has decreased, progress has been slower to address the complications and factors driving increased risk of mortality and morbidity.³⁰⁶ International and EU-based studies have highlighted that maternal deaths are more frequent among women from socio-economically disadvantaged and migrant backgrounds, who are also at a higher risk of complications during labour and delivery.^{307,308} For example, as of 2012 in Ireland, 24% of mothers who gave birth were born outside of Ireland.³⁰⁹ Quality care during labour and delivery must address the needs of migrant women to achieve equitable maternal and child health outcomes across the EU.³¹⁰ Therefore, although maternal mortality is currently a rare event within the EU, the increasingly common rise in maternal age, BMI and multiple pregnancy, and increase in number of mothers of migrant status amongst the EU population – which are all risk factors for adverse maternal outcomes during labour and delivery - may threaten *"to stop or to reverse downward trends in mortality"* unless adequately addressed.³¹¹ An approach to maternal health which includes preventative health and a focus on the overall well-being of the mother before pregnancy, must be taken to improve the birth experience of women during labour and delivery.

Monitoring and Assessing

Disparity in mode of delivery across the EU indicates an absence of consensus around standards of care across the EU. Secondly, variation in care highlights the need to understand the reasons behind these disparities. The continued debate about best practice in maternal and child health

³⁰² Bautista-Castaño, I., Henriquez-Sanchez, P., Alemán-Perez, N., Garcia-Salvador, J.J., Gonzalez-Quesada, A., García-Hernández, J.A. and Serra-Majem, L. (2013) 'Maternal Obesity in Early Pregnancy and Risk of Adverse Outcomes', PLoS ONE, Vol. 8, No. 11 <u>https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0080410</u>

³⁰³ O'Dwyer, V., Layte, R., O'Connor, C., Farah, N., Kennelly, M.M. and Turner, M.J. (2013) 'International variation in caesarean section rates and maternal obesity', Journal of Obstetrics and Gynaecology, Vol. 33, No. 5, pp. 466-70. <u>https://pubmed.ncbi.nlm.nih.gov/23815198/</u>

³⁰⁴ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf</u>

³⁰⁵ Williams, J., Greene, S., McNally, S., Murray, A. and Quail, A. (2010) Growing Up in Ireland: National Longitudinal Study of Children. The Infants and their Families: Infant Cohort. Dublin: Government Publications. <u>https://www.esri.ie/system/files?file=media/file-uploads/2015-07/BKMNEXT179.pdf</u>

³⁰⁶ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

³⁰⁷ Pedersen GS, Grontved A, Mortensen LH, et al. Maternal mortality among migrants in Western Europe: a meta-analysis. Matern Child Health J. 2014;18(7):1628-38. doi: 10.1007/s10995-013- 1403-x. <u>https://pubmed.ncbi.nlm.nih.gov/24337813/</u>

³⁰⁸ Heslehurst N, Brown H, Pemu A, et al. Perinatal health outcomes and care among asylum seekers and refugees: a systematic review of systematic reviews. BMC Med. 2018;16(1):89. doi: 10.1186/s12916-018-1064-0. <u>https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-018-1064-0</u>

³⁰⁹ National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland. <u>https://assets.gov.ie/18837/126438a9b5f84f138b8e2ddlfc5c784f.pdf</u>

³¹⁰ Access to maternal health and midwifery for vulnerable groups. EU. 2019. <u>https://www.europarl.europa.eu/RegData/etudes/</u> <u>STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

³¹¹ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) https://www.europeristat.com/images/EPHR2015_Euro-Peristat.pdf

and care should not be progressed without further research to understand and compare the causes and outcomes of obstetric interventions, such as caesarean rates.^{312,313} Despite EU-wide differences in health care, investigation of the similarities between geographically close countries which may share some commonalities in practice (for example, low levels of medical caesarean sections and instrumental intervention in the Nordic countries and the Netherlands), may further understanding of such differences.

Other areas of research recommended by EURO-PERISTAT as necessary to informing maternal care across the EU include: "comparisons of the content and scope of obstetric and midwifery education and the roles and responsibilities of midwifery and obstetric staff; a review of national policies and guidelines would be useful for comparing national policies with data about practice". Such areas of research should take into account differences in practice within as well as between countries to compare formulation and adherence to clinical guidelines, differences in impact between healthcare systems including their modes of financing, as well as patients' and professionals' attitudes to care.³¹⁴ Ultimately, the range of data collected at country-level should be expanded via PERISTAT in an evidence-based manner, and could then be shared and assessed for comparison at the EU level.

A WHO assessment of preterm births in Europe, based on national level data from 1996 to 2008, found that prevalence varied from 5 – 10%.³¹⁵ However, comparisons between countries may be limited by misclassifications of stillbirths and neonatal deaths, and the lack of standardisation in registration of births and deaths. Exploration of standards of care for labour and birth across the EU has been hampered by the lack of standardised information systems for maternal and child health: varying definitions of indicators; gaps in data available for comparison at the regional level particularly for at risk subgroups; and data on certain items not collected at all.^{316,317} Despite improvements,³¹⁸ the lack of standardised data at the EU level has persisted to-date. A 2012 publication in the International Journal of Obstetrics and Gynaecology assessed capacity to develop routine monitoring of maternal health in the EU using indicators of maternal mortality and severe morbidity. Analysis of available data, as well as gaps in data not provided from countries, indicated that the available data on maternal mortality and morbidity were insufficient for monitoring trends in standards of care over time, and for comparison of standards between countries. Even for measures which are more commonly used across the EU, such as morbidity measures, events are considered too rare to be used to monitor and compare

³¹² Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

³¹³ Betran AP, Torloni MR, Zhang JJ, et al. WHO Statement on Caesarean Section Rates. BJOG. 2016;123(5):667-70. doi: 10.1111/1471-0528.13526. <u>https://pubmed.ncbi.nlm.nih.gov/26681211/</u>

³¹⁴ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

³¹⁵ WHO (2015) Born Too Soon: Preterm Birth In Europe Trends, Causes And Prevention <u>https://www.euro.who.int/__data/assets/</u> pdf_file/0004/277735/Born-too-soon_preterm-birth-in-Europe-trends,-causes-and-prevention.pdf

³¹⁶ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide. differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284 <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

³¹⁷ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/index.php/reports/european-perinatal-health-report-2015.html</u>

³¹⁸ Zeitlin, J, Durox, M, Macfarlane, A, Alexander, S, Heller, G, Loghi, M, Nijhuis, J, Sól Ólafsdóttir, H, Mierzejewska, E, Gissler, M, Blondel, B; the Euro-Peristat Network. Using Robson's Ten Group Classification System for comparing caesarean section rates in Europe: an analysis of routine data from the Euro-Peristat study. BJOG 2021; 128: 1444- 1453.<u>https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.16634</u>

trends in Europe (i.e. insufficient available data), and as a marker of the quality of maternity care.^{319,320,321}

Institutions and networks exist across the EU to support quality care for the mother and baby during labour and delivery, for example, the Maternal and Child Health and Development Research Network.³²² The network's focus is to study the different pathological processes, nutritional and environmental conditions of the perinatal and postnatal period, informing the European Standards of Care for Newborn Health.³²³ A review from Escuriet et al (2015), appraised whether and how tools and indicators, including those from Eurostat, EURO-PERISTAT, the OECD, and WHO, enable systematic measurement and analysis of maternity care context, processes and outcomes within Europe. Several dimensions of performance measurements found to be common across the various tools and indicators included: the clinical aspects of intrapartum care; limited disaggregated analysis of low-risk women; limited measurement of non-intervention, optimal outcomes, and systemic implications; factors that influence the focus of maternity care measurement; lack of consensus regarding optimal indicator.³²⁴ Their analysis demonstrates the complexity of measuring maternity care in sufficient detail to understand, as well as compare, the experiences of women across the EU.

To further support evidence-informed decision-making across Europe, and acting on a recommendation of the 2018 PERISTAT report,³²⁵ an EU-wide study evaluated modes of delivery data using the Robson classification system: a 10 group classification cited by the WHO as *"the gold standard for assessing, monitoring and comparing CS rates within healthcare facilities over time, and between facilities."*³²⁶ This study found that, whilst not validated, the Robson classification system indicates a promising method of benchmarking, monitoring and assessing caesarean section rates across EU countries.³²⁷ Although progress has been made since the 2018 PERISTAT report, the Robson system has yet to be validated and data could not be collected in 16 countries in the EU, indicating a need for further capacity strengthening to support uniform maternal health information systems across the EU.³²⁸ Furthermore, aggregated comparisons for medical interventions during labour and delivery across the EU are not adjusted by socio-

³¹⁹ Roberts et al 2009 in National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland. <u>https://assets.gov.</u> ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.pdf

³²⁰ Bouvier-Colle, M.-H., Mohangoo, A., Gissler, M., Novak-Antolic, Z., Vutuc, C., Szamotulska, K., Zeitlin, J. and (2012), What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. BJOG: An International Journal of Obstetrics & Gynaecology, 119: 880-890. https://doi.org/10.1111/j.1471-0528.2012.03330.x

Roberts, C.L., Ford, J.B., Algert, C.S. et al. Trends in adverse maternal outcomes during childbirth: a population-based study of severe maternal morbidity. BMC Pregnancy Childbirth 9, 7 (2009). <u>https://doi.org/10.1186/1471-2393-9-7</u>

³²² Maternal and Child Health Research and Development Research Network: <u>http://www.redsamid.net/en/</u>

³²³ Maternal and Child Health Research and Development Research Network (2018) The European Standards of Care for Newborn Health. <u>http://www.redsamid.net/en/news-events/other-news/european-standards-care-newborn-health-12571.html</u>

³²⁴ Escuriet, R., White, J., Beeckman, K. et al. Assessing the performance of maternity care in Europe: a critical exploration of tools and indicators. BMC Health Serv Res 15, 491 (2015). <u>https://doi.org/10.1186/s12913-015-1151-2</u>

³²⁵ European Perinatal Health Report: core indicators of the health and care of pregnant women and babies in Europe in 2015 (2018) <u>https://www.europeristat.com/index.php/reports/european-perinatal-health-report-2015.html</u>

³²⁶ Betran AP, Torloni MR, Zhang JJ, et al. WHO Statement on Caesarean Section Rates. BJOG. 2016;123(5):667-70. doi: 10.1111/1471-0528.13526. <u>https://pubmed.ncbi.nlm.nih.gov/26681211/</u>

³²⁷ Zeitlin, J, Durox, M, Macfarlane, A, Alexander, S, Heller, G, Loghi, M, Nijhuis, J, Sól Ólafsdóttir, H, Mierzejewska, E, Gissler, M, Blondel, B; the Euro-Peristat Network. Using Robson's Ten Group Classification System for comparing caesarean section rates in Europe: an analysis of routine data from the Euro-Peristat study. BJOG 2021; 128: 1444– 1453.<u>https://obgyn.onlinelibrary.wiley.com/doi/ full/10.1111/1471-0528.16634</u>

³²⁸ Zeitlin, J, Durox, M, Macfarlane, A, Alexander, S, Heller, G, Loghi, M, Nijhuis, J, Sól Ólafsdóttir, H, Mierzejewska, E, Gissler, M, Blondel, B; the Euro-Peristat Network. Using Robson's Ten Group Classification System for comparing caesarean section rates in Europe: an analysis of routine data from the Euro-Peristat study. BJOG 2021; 128: 1444– 1453.https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.16634

demographic and economic factors, which is of concern considering that they present a risk to maternal and child health, as referenced elsewhere in this report.³²⁹

Breastfeeding and New-born Health

Breast-feeding is considered an important determinant of the health of mothers and their children, as it both ensures the best conditions for growth and development, and also lowers children's risks of non-communicable diseases in later years.³³⁰ Breastfeeding exclusively in the first six months is established as important for nutrition and bonding.^{331,332} However, rates across the EU are lower than that recommended by the WHO. Indeed, the WHO European Region is the region with the lowest levels of exclusive breastfeeding (EBF), at the age of 6 months with approximately 25%. Low rates and early cessation of breastfeeding have important adverse health consequences for women, infants, and young children, and thus protecting, promoting, and supporting breastfeeding are a public health priority.³³³

In an analysis of published data from 2006 - 2016, Sarki et al. (2019) compared breast-feeding rates across Europe disaggregated by maternal education, to determine what proportion of women exclusively breastfeed at 6 months. Nineteen EU Member States plus Norway reported rates of both EBF and any breast-feeding disaggregated by maternal education. The findings showed that six month's EBF rates were highest in Slovakia at 49% and Hungary at 44%. These two countries were closest to the WHO's target of a rate of at least 50% EBF. At 4 months EBF, mothers with higher education levels in Denmark, the Netherlands and Germany had the highest EBF rates (71, 52 and 50 %, respectively). For mothers with lower education levels, initiating breast-feeding was less likely and cessation occurred early. The inequality gap ranged from 63% in Ireland to no gap or very low levels of inequality in Poland, Sweden and Norway. Across the EU, mothers with higher education levels both initiate breast-feeding and practise EBF for longer, a trend which is linked with maternity and parental leave policies.³³⁴

To this end, the WHO has developed three tools to support healthcare workers promoting breastfeeding in Europe, demonstrating a systems approach to support.³³⁵ These are:

 "Protecting, promoting and supporting breastfeeding: the baby-friendly hospital initiative for small, sick and preterm newborns", which aims to establish a system of care that emphasizes the provision of human milk to small, sick and/or premature infants, especially those who are initially unable to feed directly at the breast. The guidance addresses the application of

³²⁹ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

³³⁰ WHO Fact sheet - Breastfeeding and Obesity <u>https://www.euro.who.int/en/health-topics/noncommunicable-diseases/obesity/</u><u>data-and-statistics/fact-sheet-breastfeeding-and-obesity</u>

³³¹ WHO Europe. 2020. *Maternal and Newborn Health*. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>

³³² WHO (2020) New WHO tools to support health-care workers promoting breastfeeding in Europe https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/news/news/2020/8/new-who-tools-to-support-health-care-workers-promoting-breastfeeding-in-europe

³³³ Theurich MA, Davanzo R, Busck-Rasmussen M, Díaz-Gómez NM, Brennan C, Kylberg E, Bærug A, McHugh L, Weikert C, Abraham K, Koletzko B. Breastfeeding Rates and Programs in Europe: A Survey of 11 National Breastfeeding Committees and Representatives. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):400-407. doi: 10.1097/MPG.00000000002234. <u>https://pubmed.ncbi.nlm.nih.gov/30562307/</u>

³³⁴ Sarki, M., Parlesak, A., & Robertson, A. (2019). Comparison of national cross-sectional breast-feeding surveys by maternal education in Europe (2006-2016). Public Health Nutrition, 22(5), 848-861. doi:10.1017/S1368980018002999 <u>https://www. cambridge.org/core/journals/public-health-nutrition/article/comparison-of-national-crosssectional-breastfeeding-surveys-bymaternal-education-in-europe-20062016/F256E2E4E3991B58823EAB711004158A</u>

³³⁵ WHO (2020) New WHO tools to support health-care workers promoting breastfeeding in Europe <u>https://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/news/news/2020/8/new-who-tools-to-support-health-care-workers-promoting-breastfeeding-in-europe</u>

the WHO Baby-friendly Hospital Initiative (BFHI) principles for small, sick and premature newborns and their mothers, and describes the implementation of the WHO-recommended Ten Steps to Successful Breastfeeding for the care of these newborns while giving additional clinical guidance as needed.

- 2. The "Competency verification toolkit: Ensuring competency of direct care providers to implement the Baby-Friendly Hospital Initiative (BFHI)." It will help countries, health-care systems and individual facilities to assess staff competency to support breastfeeding and give high-quality consultations to pregnant women and mothers. It presents performance indicators that enable the identification of correct and incorrect behaviours among maternal unit staff, and the provision of proper educational resources.
- 3. The third tool in the World Breastfeeding Week package is the "BFHI training course for maternity staff", an updated comprehensive training course in line with the BFHI. It provides an opportunity for all health workers who care for women and children to develop skills and knowledge for breastfeeding. It is built upon the revised 2018 Ten Steps to Successful Breastfeeding and can be used for pre-service education of health workers.

A comparison of national breastfeeding data and monitoring systems among selected European countries and the WHO European Region³³⁶ collected via a standardised survey of representatives of national breastfeeding committees and initiatives in 11 European countries - Belgium, Croatia, Denmark, Germany, Ireland, Italy, the Netherlands, Norway, Spain, Sweden, and Switzerland - reviewed mechanisms for the support, protection, and promotion of breastfeeding. Directly after birth, between 56% and 98% of infants in all countries were reported to receive any milk, and at 6 months 38% to 71%, and 13% to 39% of infants to be breastfeed or exclusively breastfed, respectively.

For breastfeeding and returning to work, **the WHO guidance recommends exclusive breastfeeding for the first six months of an infant's life,** and thereafter it is recommended that breastfeeding continues, in combination with appropriate complementary foods, up to two years of age and beyond.^{337,338,339} Of importance is creating a working environment that is supportive of breastfeeding mothers, for example, to breastfeed or express breast milk as needed during their working day. The WHO recommends providing necessary suitable conditions, time, space and support to facilitate the continuation of breastfeeding for employees, as far as reasonably practical and as required, up until their child's 2nd birthday. National plans addressing breastfeeding promotion, protection, and support exist in some European countries.³⁴⁰

³³⁶ Theurich MA, Davanzo R, Busck-Rasmussen M, Díaz-Gómez NM, Brennan C, Kylberg E, Bærug A, McHugh L, Weikert C, Abraham K, Koletzko B. Breastfeeding Rates and Programs in Europe: A Survey of 11 National Breastfeeding Committees and Representatives. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):400-407. doi: 10.1097/MPG.00000000002234. <u>https:// pubmed.ncbi.nlm.nih.gov/30562307/</u>

³³⁷ World Health Organisation/UNICEF. 2003. Global Strategy for Infant and Young Child Feeding. <u>http://apps.who.int/iris/bitstream/</u> handle/10665/42590/9241562218.pdf;jsessionid=9501230005792AE5F38972B47F18CFF1?sequence=1

³³⁸ WHO Europe. 2020. Maternal and Newborn Health. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>.

³³⁹ Health Services Executive. (2016). Breastfeeding in a Healthy Ireland Health Service Breastfeeding Action Plan 2016 - 2021. <u>https://www.hse.ie/eng/about/who/healthwellbeing/healthy-ireland/publications/breastfeeding-in-a-healthy-ireland.pdf</u>

³⁴⁰ Theurich MA, Davanzo R, Busck-Rasmussen M, Díaz-Gómez NM, Brennan C, Kylberg E, Bærug A, McHugh L, Weikert C, Abraham K, Koletzko B. Breastfeeding Rates and Programs in Europe: A Survey of 11 National Breastfeeding Committees and Representatives. J Pediatr Gastroenterol Nutr. 2019 Mar;68(3):400-407. doi: 10.1097/MPG.00000000002234. <u>https://pubmed.ncbi.nlm.nih.gov/30562307/</u>

FOUR: HEALTH CONDITION MANAGEMENT

Health and lifestyle affect fertility, maternal health, and child development. Healthy lifestyles and well-being are important for managing conditions to ensure healthy outcomes for both mother and child.³⁴¹ In addition, pregnancy can act as a stress-test for women experiencing certain health conditions. This section addresses some salient health conditions related to maternal health.

Diabetes

Diabetes Management

Managing diabetes during pregnancy represents a particular challenge. Controlling blood glucose levels of expectant mothers suffering from either type 1 or 2 diabetes is difficult, and this can have an impact on both mother and foetus. Diabetics who are planning to become pregnant should meet with their doctors - who should be experienced in treatment of pregnant women with diabetes - in order to make a plan for pregnancy.³⁴² It is important to bring blood glucose levels close to a target range prior to becoming pregnant, and to achieve a healthy body mass index as part of bringing blood glucose levels under control.³⁴³ Where a pregnancy is unplanned it is important for women who are diabetic to consult their doctor as soon as possible.

Pregnant women who have diabetes should maintain close contact with their doctor over the course of the pregnancy. Blood glucose levels need to be monitored much more frequently and anti-hyperglycaemic therapy must be regularly adapted because of pregnancy-related increase in insulin resistance over the course of pregnancy. It may be necessary to make adjustments to any medication that is habitually taken to manage the disease.³⁴⁴

Women with type 1 or type 2 diabetes who have uncontrolled or undiagnosed diabetes during pregnancy are at increased risk of complications which can affect the health of the mother and the foetus. Where diabetes is not well controlled, women are at risk of premature birth, miscarriage or stillbirth,³⁴⁵ and babies are at greater risk of developing serious birth defects, in particular those affecting the heart, brain or spine.³⁴⁶ During the early months of the pregnancy, when the organs of the foetus are being formed, birth defects can develop where blood sugar is uncontrolled. Where pregnancy is unplanned this often occurs before the woman knows she is pregnant. Uncontrolled diabetes may also lead to the foetus growing excessively large, which can cause discomfort for the mother towards the end of the pregnancy. This can also lead to issues during delivery, making delivery by caesarean section more likely.³⁴⁷ Women with pre-existing diabetes are more likely to have high blood pressure and are therefore at greater risk of preeclampsia which can lead to stroke or seizure in expectant mothers.

³⁴¹ WHO Europe. 2020. *Maternal and Newborn Health*. <u>http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/maternal-and-newborn-health</u>

³⁴² Centres for Disease Control and Prevention. 2017. *Type 1 or Type 2 Diabetes and Pregnancy*. <u>https://www.cdc.gov/pregnancy/diabetes-types.html</u>

³⁴³ National Institute of Diabetes and Digestive and Kidney Diseases. 2017. *Pregnancy if You Have Diabetes*. https://www.niddk.nih. gov/health-information/diabetes/diabetes-pregnancy

³⁴⁴ Centres for Disease Control and Prevention. 2017. *Type 1 or Type 2 Diabetes and Pregnancy*. <u>https://www.cdc.gov/pregnancy/diabetes-types.html</u>

³⁴⁵ Centres for Disease Control and Prevention. 2017. *Type 1 or Type 2 Diabetes and Pregnancy*. <u>https://www.cdc.gov/pregnancy/diabetes-types.html</u>

³⁴⁶ National Institute of Diabetes and Digestive and Kidney Diseases. 2017. *Pregnancy if You Have Diabetes.* https://www.niddk.nih. gov/health-information/diabetes/diabetes-pregnancy

³⁴⁷ Centres for Disease Control and Prevention. 2017. *Type 1 or Type 2 Diabetes and Pregnancy*. <u>https://www.cdc.gov/pregnancy/diabetes-types.html</u>

Gestational Diabetes Mellitus

GDM is a form of diabetes that occurs during pregnancy, usually developing during the latter half of pregnancy.³⁴⁸ GDM is estimated to occur in 3.8 to 7.8% of pregnancies in Europe.³⁴⁹ While the exact number of women who suffer with GDM over the course of their pregnancy is unknown, its prevalence appears to be increasing.³⁵⁰ Women in Southern Mediterranean countries appear to be at greater risk of developing GDM than they are in Northern EU countries. There is currently no consensus across EU Member States on testing, diagnostic procedures, and screening and policy tackling GDM varies accordingly across states.³⁵¹

In addition, there can be malformations such as hyperglycaemia which emerge in the second part of pregnancy. Adiposity, a common characteristic of women with GDM, can also increase the risk of stillbirths and malformations. **Women and their infants have a greater risk of developing type 2 diabetes in the future**. As much as half of all women who experienced GDM during their pregnancy will develop type 2 diabetes within 5 years of the birth,³⁵² with obesity representing an added risk factor in the emergence of this disease.³⁵³ **Children born to women who suffered from GDM over the course of their pregnancy are six times more likely to develop type 2 diabetes** than children born to mothers who did not develop GDM.³⁵⁴ Children born to women with diabetes are also more likely to develop childhood obesity.³⁵⁵ **The EBCOG advocates that in a context where the incidence of GDM is rising globally, there is a need for more uniformity in GDM screening across Europe as it is an opportunity for more timely diagnosis and treatment for GDM in a greater number of women.³⁵⁶**

Hypertensive Disorders

The uniqueness of pregnancy as an event in the life course of a woman is that the physiologic demands of pregnancy act as a "stress test". Pregnancy can reveal underlying or undiagnosed diseases that might have been dormant or unrecognized, as well as the risk of future chronic conditions. As an example, hypertensive disorders were among the most common diagnoses in women presenting for antenatal care and postpartum care (2.9% and 4.1%, respectively). It is well established that hypertensive disorders of pregnancy, particularly pre-eclampsia, increase the future risk of hypertension, stroke, cardiovascular disease, and premature death.

Cardiovascular Disease

Pregnancy can be thought of as a stress-test for heart disease in women. Hypertensive disorders affect approximately 5-10% of all pregnancies and are important contributors to maternal and

³⁴⁸ Diabetes UK. 2015. *Diabetes News*. https://www.diabetes.org.uk/about_us/news/gestational-diabetes-and-children

³⁴⁹ Eades, Claire E., Dawn M. Cameron, and Josie MM Evans. "Prevalence of gestational diabetes mellitus in Europe: A metaanalysis." *Diabetes Research and Clinical Practice* 129 (2017): 173-181. <u>https://pubmed.ncbi.nlm.nih.gov/28531829/</u>

³⁵⁰ Buckley, Brian S., Jürgen Harreiter, Peter Damm, Rosa Corcoy, Ana Chico, David Simmons, Akke Vellinga, and Fidelma Dunne. "Gestational diabetes mellitus in Europe: prevalence, current screening practice and barriers to screening. A review." *Diabetic medicine* 29, no. 7 (2012): 844-854. <u>https://doi.org/doi:10.1111/j.1464-5491.2011.03541.x</u>

³⁵¹ Diabetes Ireland. 2017. *Gestational Diabetes.* https://www.diabetes.ie/living-with-diabetes/diabetes-pregnancy/gestationaldiabetes/

³⁵² National Institute for Health and Care Excellence. 2015. *Diabetes in pregnancy: management from preconception to the postnatal period*. https://www.nice.org.uk/guidance/ng3/chapter/2-research-recommendations#postnatal-treatment-for-women-diagnosed-with-gestational-diabetes

³⁵³ Kwak, Soo Heon, Sung Hee Choi, Hye Seung Jung, Young Min Cho, Soo Lim, Nam H. Cho, Seong Yeon Kim, Kyong Soo Park, and Hak C. Jang. "Clinical and genetic risk factors for type 2 diabetes at early or late post-partum after gestational diabetes mellitus." *The Journal of Clinical Endocrinology & Metabolism* 98, no. 4 (2013): e744-e752. <u>https://pubmed.ncbi.nlm.nih.gov/23471980/</u>

³⁵⁴ Diabetes UK. 2015. *Diabetes News.* https://www.diabetes.org.uk/about_us/news/gestational-diabetes-and-children

³⁵⁵ Hillier, Teresa A., Kathryn L. Pedula, Mark M. Schmidt, Judith A. Mullen, Marie-Aline Charles, and David J. Pettitt. "Childhood obesity and metabolic imprinting." *Diabetes care* 30, no. 9 (2007): 2287-2292. <u>https://diabetesjournals.org/care/article/30/9/2287/29335/</u> <u>Childhood-Obesity-and-Metabolic-ImprintingThe</u>

³⁵⁶ Hod, Moshe et al. European Journal of Obstetrics and Gynecology and Reproductive Biology, Volume 228, 329 - 330

neonatal morbidity and mortality worldwide.^{357,358} In high income countries, mortality rates among pregnant women are generally low, but heart disease has been identified as the leading cause of death during pregnancy.³⁵⁹ The severe forms of hypertensive pregnancy disorders, preeclampsia and the HELLP-syndrome, lead to a two-fold increase in future CVD risk and are now acknowledged as a CVD risk factor.^{360,361}

To address the lack of understanding and guidance of heart disease in pregnancy, the European Society of Cardiology set up the first formal CVD pregnancy registry in 2007. Reassuringly, results from the pregnancy registry show that most women with heart disease can go through pregnancy and delivery safely, as long as they are adequately evaluated, receive counselling, and high-quality care.

However, many symptoms of heart disease – such as shortness of breath, fatigue, and heartburn – are similar to general pregnancy symptoms, making heart disease during pregnancy difficult to recognise and diagnose. Women suffering from a congenital heart disease need to be careful with regard to pregnancy and birth control options as both can increase heart risk in vulnerable populations.³⁶²

Urinary Incontinence

In 2016, urinary incontinence affected an estimated 10-20% of people in Europe, about 60 million. Urinary incontinence is twice as common in women as it is in men, although the numbers of men affected by urinary incontinence are increasing, especially as a result of post-prostatectomy incontinence (surgery for prostate cancer). Women are more likely to develop urinary incontinence, for example as a result of post-partum complications. Furthermore, taking care of family members suffering from all forms of incontinence is predominately the task of women as informal carers. Interventions such as pelvic floor muscle training have been proven effective with regard to urinary incontinence. However, the many treatment options are all too often not discussed or even offered. Despite its frequency and impact, there is a lack of understanding, awareness and support surrounding urinary incontinence in Europe.³⁶³ Much needs to be done to help remove the stigma and taboo associated with incontinence. The World Federation of Incontinence and Pelvic Problems (WFIPP) is the internationally recognised forum helping to address these issues on a global scale.³⁶⁴

Women with a history of adverse pregnancy outcomes are at increased risk of cardiovascular and metabolic diseases later in life. Data increasingly links maternal vascular, metabolic, and

³⁵⁷ Kuklina, Elena V., Carma Ayala, and William M. Callaghan. "Hypertensive disorders and severe obstetric morbidity in the United States." Obstetrics & Gynecology 113, no. 6 (2009): 1299-1306. <u>https://europepmc.org/article/med/19461426</u>

³⁵⁸ Duley, Lelia. 2009. The global impact of pre-eclampsia and eclampsia. In *Seminars in perinatology*, vol. 33, no. 3: 130-137. <u>https://pubmed.ncbi.nlm.nih.gov/19464502/</u>

³⁵⁹ Hughes, Sue. "Heart Disease Is Lead Cause of Death in Pregnancy." *Medscape,* September 13, 2012. https://www.medscape.com/viewarticle/770901. https://www.medscape.com/viewarticle/770901

³⁶⁰ Bellamy, L., Casas, J.P., Hingorani, A.D. and Williams, D.J., 2007. Pre-eclampsia and risk of cardiovascular disease and cancer in later life: systematic review and meta-analysis. *Bmj*, 335(7627), p.974. <u>https://pubmed.ncbi.nlm.nih.gov/17975258/</u>

³⁶¹ Bushnell, Cheryl, Louise D. McCullough, Issam A. Awad, Monique V. Chireau, Wende N. Fedder, Karen L. Furie, Virginia J. Howard et al. "Guidelines for the prevention of stroke in women." *Stroke*45, no. 5 (2014): 1545-1588. <u>https://pubmed.ncbi.nlm.nih.gov/24503673/</u>

³⁶² Kaemmerer, Mathias, Matthäus Vigl, Vanadin Seifert-Klauss, Nicole Nagdyman, Ulrike Bauer, Karl-Theo Maria Schneider, and Harald Kaemmerer. "Counseling reproductive health issues in women with congenital heart disease." *Clinical Research in Cardiology* 101, no. 11 (2012): 901-907. <u>https://libgen.ggfwzs.net/book/19515689/5b397b</u>

³⁶³ European Institute of Women's Health. (2018). *Women and urinary incontinence in the EU*. <u>https://eurohealth.ie/women_and_incontinence_2018/</u>

³⁶⁴ www.wfipp.org; www.supportincontinence.org

inflammatory complications of pregnancy with an increased risk of vascular disease in later life. $^{\rm 365,366}$

Iron

The European Food Safety Authority has proposed a scientific opinion,³⁶⁷ following a request from the European Commission Panel on Dietetic Products, Nutrition and Allergies derived **Dietary Reference Values (DRVs) for iron**. These include Average Requirement (AR) and Population Reference Intake (PRI). For pregnant and lactating women, it is assumed that iron stores and enhanced absorption provided sufficient additional iron, and that DRVs are the same as for premenopausal women.

Understanding the iron status in pregnant women in Europe provides a foundation for considering the role of iron screening and supplementation.³⁶⁸ Available reports and studies have used different approaches that make creating overall summaries and data on pregnant women challenging, therefore, data on women of reproductive age provide useful background information including baseline iron stores in pregnant women. In a review of iron status in pregnant women and women of reproductive age in 15 European countries, the prevalence of iron deficiency (ID) and iron deficiency anaemia (IDA) was 10-32% and 2-5%, respectively. Approximately 20-35% of European women of reproductive age had sufficient iron stores to complete a pregnancy without supplementary iron. During pregnancy, European women in controlled supplementation trials who were not receiving iron supplements displayed increasing prevalence of ID and IDA during pregnancy, which peaked in the middle to late third trimester. Women who were taking iron supplements had higher iron status and lower prevalence of ID and IDA, which were dependent on the dose of iron and compliance. The data suggest that, in Europe, the iron status of reproductive-aged women varies by region and worsens in pregnancy without iron supplementation.

According to the WHO,³⁶⁹ accurate determination of iron status is crucial for diagnostic and screening purposes in the clinical setting and to guide public health interventions at the population level. In an individual patient, diagnosis of iron deficiency or overload will help guide management, including further investigations and appropriate therapy. At the population level, determination of the magnitude and distribution of iron deficiency can help to prioritize appropriate interventions in settings in which the prevalence is regarded as a severe public health problem, or help to identify populations with hereditary conditions that predispose them to iron overload.

An assessment of dietary iron intake in pregnant women in Europe reviewed literature from 1990 - 2019, including 24 studies from 14 countries.³⁷⁰ Across 11 countries, iron intake varied between

³⁶⁵ Neiger R. (2017). Long-Term Effects of Pregnancy Complications on Maternal Health: A Review. Journal of clinical medicine, 6(8), 76. https://doi.org/10.3390/jcm6080076

 ³⁶⁶ https://www.npr.org/sections/health-shots/2019/01/24/686790727/fourth-trimester-problems-can-have-long-term-effects-ona-moms-health?t=1652478158131

³⁶⁷ European Food and Safety Authority: Draft Scientific Opinion. Scientific Opinion on Dietary Reference Values for iron. EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA,

https://www.efsa.europa.eu/sites/default/files/consultation/150526.pdf

³⁶⁸ Nils Milman, Christine L Taylor, Joyce Merkel, Patsy M Brannon, Iron status in pregnant women and women of reproductive age in Europe, The American Journal of Clinical Nutrition, Volume 106, Issue suppl_6, December 2017, Pages 1655S-1662S, <u>https://doi.org/10.3945/ajcn.117.156000</u>

³⁶⁹ WHO (2020) WHO guideline on use of ferritin concentrations to assess iron status in individuals and populations <u>https://www.who.int/publications/i/item/9789240000124</u>

³⁷⁰ Milman, N.T. (2020) Dietary Iron Intake in Pregnant Women in Europe: A Review of 24 Studies from 14 Countries in the Period 1991-2014. Journal of Nutrition and Metabolism 2020 Vol. 2020 Pages 7102190 <u>https://www.hindawi.com/journals/jnme/2020/7102190/</u>

8.3-15.4 mg/day with an estimated "median" value of 10-11 mg/day. Spain, Bosnia, and Poland reported an intake of 8.3-10.1 mg/day, Croatia, England, Norway, and Finland an intake of 10.2-11.4 mg/day, and Germany, Portugal, Czech Republic, and Greece an intake of 12.2-15.4 mg/day. The recommended iron intake in the various countries varied from 14.8-30 mg/day. In all studies, 60-100% of the women had a dietary iron intake below the recommended intake.

The authors note that in Europe, the majority of pregnant women have a dietary iron intake which is markedly below the recommended intake, contributing to a low iron status in many pregnant women. Most guidelines do not advise routine iron supplements, while two guidelines (WHO and Nordic Nutrition Recommendations) recommend routine iron supplementation during pregnancy. Within the European community, there is a need to reach consensus on the various guidelines and on the issue of iron supplementation. There is a need to establish common European standardized dietary methods, uniform Dietary Reference Values, and uniform statistical methods in order to perform more reliable comparisons between studies in different countries.

In a 2018 study, iron supplementation during pregnancy was assessed via a cross-sectional study undertaken in four German states.³⁷¹ Noting that iron deficiency but also iron overload during pregnancy has been associated with unwanted health effects, the authors highlight that in Germany, iron supplements are only recommended for pregnant women with diagnosed iron deficiency/anaemia. The authors investigated the prevalence of iron supplement intake among pregnant women and explored determining factors to assess whether women are following the advice to only supplement iron in case of a diagnosed iron deficiency/anaemia. Of 207 participants, 65.2% had supplemented iron. 84.4% reported to have done this because of a diagnosed iron deficiency/anaemia. Iron intake ranged from 5 to 200 mg/day, and duration of supplementation varied between two weeks and throughout gestation. Of women who reported to have been diagnosed with iron deficiency/anaemia, 47.5% had supplemented \geq 80 mg/day iron, while 26.2% had taken iron in lower amounts ≤40 mg/day. Six percent of the participating women had not supplemented iron in spite of a diagnosed iron deficiency/anaemia, whereas 19.7% of women without iron deficiency/anaemia still had supplemented iron (range: 7 to 80 mg/day). The majority of pregnant women used iron supplements in case of a diagnosed iron deficiency/ anaemia. However, not all women with iron deficiency/anaemia supplemented (sufficient amounts of) iron, while there was also indiscriminate use of iron supplements in women without iron deficiency/anaemia.

COVID-19

The coronavirus also has implications for the treatment and care of women who are pregnant. According to the European Centre for Disease Prevention and Control (ECDC), clinical manifestations in pregnant women can range from asymptomatic to mild; however, there have been reports of critical cases in countries like Sweden.³⁷² To-date, there is very little data and information on the role that COVID-19 plays in pregnancy. Pregnant women experience physical changes that may increase their risk of some infections. Studies of other diseases, such as SARS and influenza, have shown that pregnant women have higher rates of infection and have more severe outcomes when compared to women of the same age groups.³⁷³

³⁷¹ Demuth, I.R., Martin, A. & Weissenborn, A. Iron supplementation during pregnancy – a cross-sectional study undertaken in four German states. BMC Pregnancy Childbirth 18, 491 (2018). <u>https://doi.org/10.1186/s12884-018-2130-5</u>

³⁷² ECDC. 2020. Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – eighth update <u>https://www.ecdc.europa.eu/sites/</u> <u>default/files/documents/covid-19-rapid-risk-assessment-coronavirus-disease-2019-eighth-update-8-april-2020.pdf</u>

³⁷³ Theiler, Regan N., et al. "Emerging and zoonotic infections in women." Infectious disease clinics of North America 22.4 (2008): 755-772.

There are no conclusive findings on COVID-19 affecting the unborn baby, but the ECDC concludes that intrauterine transmission cannot be ruled out, citing emerging reports that suggest possible perinatal transmission. In previous non-COVID-19-specific studies, fever in the first trimester has been shown to have a possible teratogenic effect. In addition, neonates can be exposed to COVID-19 when passing through the birth canal or through postnatal exposure.³⁷⁴ **As a result, caesarean delivery has been used as a precautionary measure in infected mothers. There is a paucity of evidence regarding transmission during breastfeeding. As pregnant women are considered a vulnerable and high-risk group for COVID-19, efforts must be also made to study the safety of immunising pregnant women against coronavirus during the vaccination development. From a sample of 95 publications, pregnant individuals were found to be at a heightened risk of more severe symptoms than people who are not pregnant.³⁷⁵**

The *Midwifery*, September 2020 publication shone a light on the impact of the coronavirus pandemic on maternity care in Europe.³⁷⁶ 2020 was a year marking the end of the Second World War, reflecting on 75 years of peace, and celebrating the bicentenary of Florence Nightingale's birth in 1820. The WHO designated 2020 as the Year of the Nurse and Midwife. Florence Nightingale was most often associated with sanitation and infection control during her work in the Crimean war, and those insights remain with the authors as they seek to provide safe, high quality maternity care in the era of Covid-19. Their article considers the impact of Covid-19 on maternity care in Europe: covering topics such as changes to working practices in maternity care, antenatal and postnatal care, the situation for staff providing care to pregnant women and their families, and deaths amongst midwives and health care workers.

A study that took place in Dublin,³⁷⁷ published in the European Journal of Obstetrics and Gynaecology and Reproductive Biology, **found evidence of no negative impact on maternal or neonatal outcomes during the course of the pandemic**; a decrease in preterm birth rates during the Covid-19 pandemic; and less disclosures of domestic violence during the peak of the pandemic. **To generate this evidence, the study aimed to explore apparent trends in maternal or neonatal outcomes during the Covid-19 pandemic, by comparing maternity outcomes before, during, and after the pandemic.** The authors carried out a retrospective review of maternity statistics recorded on the hospital database of a large tertiary referral centre in Dublin with over 8,000 deliveries per annum between 1st January and 31st July 2020. **They concluded no negative effect of the Covid-19 pandemic on maternity services, demonstrated by maternal and neonatal outcomes**.

Another study, also in the Irish context,³⁷⁸ explored the impact of Covid-19 on maternity care through an evaluation of both clinical and experiential outcomes in a two-phase study at one hospital site in Ireland. The study design was a before and during comparative audit of clinical outcome data in women attending an urban, tertiary, referral maternity hospital that has an annual birth rate of just under 8,000. The study found that **practice changes implemented as a result of COVID 19, in general, have affected relatively few maternal clinical outcomes, although those**

³⁷⁴ ECDC. 2020. Coronavirus disease 2019 (COVID-19) in the EU/EEA and the UK – eighth update <u>https://www.ecdc.europa.eu/</u> <u>sites/default/files/documents/covid-19-rapid-risk-assessment-coronavirus-disease-2019-eighth-update-8-april-2020.pdf</u>

Kotlar, B., Gerson, E., Petrillo, S. et al. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review. Reprod Health 18, 10 (2021). <u>https://doi.org/10.1186/s12978-021-01070-6</u>

³⁷⁶ Jennifer Zeitlin, Emile Papiernik, Gérard Bréart (2004) Regionalization of perinatal care in Europe, Seminars in Neonatology, Volume 9, Issue 2, Pages 99-110, ISSN 1084-2756, <u>https://doi.org/10.1016/j.siny.2003.08.004</u>

³⁷⁷ McDonnell, Sarah et al. (2020) The impact of the Covid-19 pandemic on maternity services: A review of maternal and neonatal outcomes before, during and after the pandemic. European Journal of Obstetrics and Gynecology and Reproductive Biology, Volume 255, 172 - 176 <u>https://www.ejog.org/article/S0301-2115(20)30653-9/abstract</u>

³⁷⁸ Smith, V. et al (2020) The Impact Of COVID-19 On Maternity Care <u>https://www.tcd.ie/research/res</u>
affected have the potential to impact considerably on women's intrapartum and postpartum health and wellbeing. Such outcomes included proportionally increased elective compared to emergency caesarean section rates, increased caesarean section in multiparous women, increased augmentation of labour and increased rates of IOL for post-dates. Further exploration is warranted to explain these findings, but practices related to controlling the environment following lockdown may have been influential drivers. For example, the increased elective compared to emergency CS rate and the increase in CS in multiparous women may be interlinked. Due to the pandemic, women with previous CS may have been more inclined, or may have been advised to opt for an elective repeat CS rather than planned vaginal birth after CS. This might be because the former allows for scheduling and thus a degree of control over maternity admissions during the lockdown period. Irrespective of possible reasons, having awareness of these findings can be helpful as the COVID-19 pandemic continues. This will help ensure that any practice changes implemented as a result of COVID-19 are not inadvertently impacting negatively on women's labour, birth and postpartum outcomes.

Kotlar et al (2020)³⁷⁹ conducted a scoping review of the literature to examine the impact of the Covid-19 pandemic on maternal and perinatal health globally, including high-, middle-, and low-income countries. It was conducted to compile evidence on direct and indirect impacts of the pandemic on maternal health and provide an overview of the most significant outcomes this far. **Pregnant individuals were found to be at a heightened risk of more severe symptoms than people who are not pregnant**. Labour, delivery, and breastfeeding guidelines for COVID-19 positive patients varied. **The study concluded that pregnant women and mothers were not found to be at higher risk for COVID-19 infection** than people who are not pregnant women with symptomatic COVID-19 may experience more adverse outcomes compared to non-pregnant people and seem to face disproportionate adverse socio-economic consequences.

Strep B

Group B Strep, or Strep B, is a bacterial infection that mothers can pass to new-borns during delivery, yet it is highly preventable. Group B streptococcus is found in about one third of adults and about one-quarter of pregnant women. The infection is not harmful to adults and typically does not present with symptoms in this population. **However, Group B Strep is a life-threatening disease infection in newborns. Infants that contract the infection during labour are susceptible to harmful diseases including meningitis, sepsis, and pneumonia, which can result in long-term health issues and can lead to death.**

Many women are unaware of their Strep B status during pregnancy. About half of pregnant women do not know about Group B Strep. Consequently, it is vital to raise awareness and conduct routine screenings for pregnant women to prevent avoidable infant mortality. Following a lab test at 35-37 weeks, a pregnant women with Group B Strep can be treated during delivery to prevent infant transmission through the administration of an antibiotic at the onset of labour. The treatment reduces the risk of the infant developing an infection by 80%.

In the EU, Belgium, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Lithuania, Poland, Slovenia, and Spain offer maternal screenings to prevent the transmission of the infection. For instance, Spain has drastically reduced the infection rate of infants by administering antibiotics

³⁷⁹ Kotlar, B., Gerson, E., Petrillo, S. et al. The impact of the COVID-19 pandemic on maternal and perinatal health: a scoping review. Reprod Health 18, 10 (2021). <u>https://doi.org/10.1186/s12978-021-01070-6</u>

to mothers with Group B Strep over the last decade. Unfortunately, testing for Strep B is not provided to all women across Europe. Moreover, due to a lack of screening standardisation and treatment disparities, newborns from low-income areas are more likely to die from Strep B infections than those high-income areas. The EIWH applauds the countries that screen all mothers for Group B Strep and urgently calls on all EU Member States to raise awareness, to prevent transmission and to reduce health inequities.

Asthma

Symptoms of asthma can vary during pregnancy. One-third of women report that their asthma worsens, one-third report that their asthma improves, and one-third report that their asthma remains unchanged.^{380,381} Controlled asthma rarely causes complications during pregnancy. Severe, uncontrolled asthma, however, poses a health threat to both the mother and the foetus. Uncontrolled asthma decreases the mother's blood oxygen levels thus reducing the supply of oxygen available to the developing foetus. This condition may lead to impaired foetal development. Complications to the mother include high blood pressure, toxaemia, premature delivery, and preeclampsia.

To better control asthma while pregnant, doctors recommended avoiding known triggers and working with a trusted medical professional. Though most asthma medications are safe to use during pregnancy, the women should consult with their doctors as to whether an adjustment of medications is required.

Smoking

If a woman is planning a pregnancy or is pregnant, she should immediately quit smoking. Smoking during pregnancy increases the risk of the child developing asthma, even when the child is not exposed to second-hand smoke after birth. Children exposed to smoking in the womb were two-thirds more likely to have asthma by age six compared to children whose mothers did not smoke during pregnancy. Smoking during the first trimester only also results in a higher risk of asthma for children, which underscores the importance for women who are planning to become pregnant to cease smoking prior to doing so.

Mental Health

In the EU, about 27% of adults will suffer from at least one mental health condition.³⁸² More women than men experience mental health conditions. Women also use mental health services and medication more frequently than do men.³⁸³ In the EU, stress adversely impacts women, particularly related to excess balancing of work, family and financial issues.³⁸⁴ The Lancet has examined the impact of poverty on maternal mental health globally.³⁸⁵

³⁸⁰ "Pregnancy and Asthma." ACAAI Public Website. 20 Mar. 2017. <u>https://acaai.org/asthma/asthma-101/who-gets-asthma/pregnancy-and-asthma/</u>

³⁸¹ Cadeddu, C., S. Capizzi, D. Colombo, M. Nica, and A. G. De Belvis. "Literature review of gender differences in respiratory conditions: a focus on asthma and Chronic Obstructive Pulmonary Disease (COPD)." *Igiene e sanita pubblica* 72, no. 5 (2016): 481-504. <u>https://pdf.manuscriptpro.com/search/Abstract-28068678/1/bcb4b22c/Literature-review-of-gender-differences-in-respiratory-conditions:-a-focus-on-asthma-and-Chronic-Obstructive-Pulmonary-Disease-(COPD).</u>

³⁸² European Parliament. 2016. Resolution on promoting gender equality in mental health and clinical research (2016/2096(INI)) http://www.europarl.europa.eu/doceo/document/A-8-2016-0380_EN.html#title2

³⁸³ EU-WMH Project. Mental health in Europe: a gender perspective. <u>http://www.eu-wmh.org/PDF/FactSheet_Gender.pdf</u>

³⁸⁴ Chunn, L. (2019). "Women Are at Breaking Point Because of Workplace Stress: Wellbeing Survey from Cigna." *Forbes*. <u>https://www.forbes.com/sites/elisabethbrier/2019/09/10/samsara-founders-sanjit-biswas-and-john-bicket-are-now-billionaires-thanks-to-the-industrial-internet-of-things-startups-latest-funding-round/#2fec1d2b4660</u>

³⁸⁵ Parra-Saavedra, Miguel et al. (2021). Maternal mental health is being affected by poverty and COVID-19 The Lancet Global Health, Volume 9, Issue 8, e1031 - e1032 https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(21)00245-X/fulltext

The risk of depression in the general population is 10-15%, with women twice as likely to be affected as men. A moderate and statistically significant higher risk of stillbirth and infant mortality for women with prenatal mental health disorders (including high and low prevalence disorders) was found, compared with women without prenatal mental health disorders. Women with prenatal mental health disorders (especially anxiety and depression) are at a higher risk of perinatal and infant mortality, compared with women without prenatal mental health disorders, with consistent effects across a range of mental health disorders. Prenatal screening and access to treatment for mental health disorders may reduce the risk of perinatal and infant mortality (Adane et al., 2021).²⁸⁶ Furthermore, women with a range of different mental health disorders are at distinctly higher risk of delivering a preterm or low birthweight baby (Ding et al. 2014²⁸⁷; Grigoriadis et al. 2018²⁸⁸; Grote et al. 2010²⁸⁹) and of having children with poorer developmental outcomes (Reupert et al. 2013²⁹⁰). The underlying reasons for the higher risk of adverse perinatal outcomes among women with prenatal mental health disorders are not yet fully understood, but they are likely to include a complex array of mechanisms that include direct disease effects, behavioural factors and comorbidities, and increased risk of pregnancy complications. Therefore, comprehensive support, care, and careful treatment for women with a mental health disorder are needed.³⁹¹ However, rates of perinatal depression have been reported to be as high as 20%. Regarding the antenatal phase, 18% of women exhibit depressive symptoms.

Depression in pregnancy or following delivery may be due to a pre-existing depression, a relapse of depression or a new onset depression. Depression not only affects the mother, but also has implications for the mother-infant relationship, attachment, the infant's cognitive and emotional development and the wellbeing of other family members. For example, children exposed to maternal depressive symptoms have poorer language skills than children who are not exposed to maternal depressive symptoms. Since children's language skills play a crucial role in school readiness and success, it is essential to understand the factors underlying the relationship between maternal depressive symptoms and children's language skills (Schreiber et al., 2022).³⁹² Paternal depression may also occur. Having a partner with depressive symptoms can imply less support and less involvement during pregnancy, which can decrease the marital adjustment that is required to develop prenatal attachment to a foetus.

Thus, depression during and after pregnancy is an important issue with large implications for the mother, child and the family. Associations of maternal depression with premature delivery and the lower likelihood of breastfeeding initiation were reported. Experts estimate that perinatal depression affects as many as 1 in 5 pregnant women. Despite its prevalence, many

³⁸⁶ Adane AA, Bailey HD, Morgan VA, Galbally M, Farrant BM, Marriott R, White SW, Shepherd CC. The impact of maternal prenatal mental health disorders on stillbirth and infant mortality: a systematic review and meta-analysis. Arch Womens Ment Health. 2021 Aug;24(4):543-555. doi: 10.1007/s00737-020-01099-9 <u>https://pubmed.ncbi.nlm.nih.gov/33386983/</u>

³⁸⁷ Ding XX et al (2014) Maternal anxiety during pregnancy and adverse birth outcomes: a systematic review and meta-analysis of prospective cohort studies. J Affect Disord 159:103–110. <u>https://pubmed.ncbi.nlm.nih.gov/24679397/</u>

³⁸⁸ Grigoriadis S, Graves L, Peer M, Mamisashvili L, Tomlinson G, Vigod SN, Dennis CL, Steiner M, Brown C, Cheung A, Dawson H, Rector NA, Guenette M, Richter M (2018) Maternal anxiety during pregnancy and the association with adverse perinatal outcomes: systematic review and meta-analysis. J Clin Psychiatry 79. <u>https://pubmed.ncbi.nlm.nih.gov/30192449/</u>

³⁸⁹ Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ (2010) A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. JAMA Psychiatry 67:1012-1024. <u>https://pubmed.ncbi.</u> <u>nlm.nih.gov/20921117/</u>

³⁹⁰ Reupert AE, Maybery JD, Kowalenko NM (2013) Children whose parents have a mental illness: prevalence, need and treatment. Med J Aust 199:S7-S9. <u>https://pubmed.ncbi.nlm.nih.gov/25369850/</u>

³⁹¹ Adane AA, Bailey HD, Morgan VA, Galbally M, Farrant BM, Marriott R, White SW, Shepherd CC. The impact of maternal prenatal mental health disorders on stillbirth and infant mortality: a systematic review and meta-analysis. Arch Womens Ment Health. 2021 Aug;24(4):543-555. doi: 10.1007/s00737-020-01099-9 https://pubmed.ncbi.nlm.nih.gov/33386983/

³⁹² Scheiber FA, Ryckman KK, Demir-Lira ÖE. Maternal depressive symptoms and maternal child-directed speech: A systematic review. J Affect Disord. 2022 Jan 15;297:194-207 <u>https://www.sciencedirect.com/science/article/abs/pii/S0165032721010892</u>

challenges surround the diagnosis, treatment and support of depression, including stigma and under-resourcing. Not only is the disorder under-recognized, treatment uptake is also poor; women continue to experience symptoms into the postpartum time and 54.2% of women with "postpartum depression" have actually had depression before or during pregnancy (Grigoriadis et al., 2013).³⁹³

For example, PND affects about 20% of women in Ireland every year. It can develop after any pregnancy up to six months after giving birth; the most common occurrence seems to be six to ten weeks after delivery. Professional, family and community support helps speed recovery. **More support and information is needed to increase awareness and support women suffering from PND. Efforts must be made to reduce the stigma of depression as well.**

In relation to the assessment of effectiveness of services and identifying outcomes, the review also describes how there is scope for improvement. The review identified that the number of perinatal deaths is related to geographical region. Areas with deprived populations and greater proportions of older or younger mothers show a higher number of perinatal deaths. While controlling for the effects of such deprivation and maternal age on perinatal death between geographical regions, there is still a marked variation which can be associated with effectiveness of care. Maternal mortality has declined progressively over time. However, in an enquiry by MBRRACE-UK in 2015, half of maternal death would have led to a different outcome if better care had been provided.³⁹⁴ With depression and anxiety affecting 15-20% of women in the first year after childbirth, almost one in five women stated that they were not asked about their emotional state, or mental health, at the time of booking their maternity care. The review found that there is scope for significant improvement and a need for a more consistent approach to learning and improvement.³⁹⁵ Implementing screening processes and interventions aimed at reducing the psychological impact of the transition to parenthood and at improving familial wellbeing are needed. We recommend devising an intersectional approach to address issues surrounding depression and pregnancy, such as combining health literacy efforts with healthcare professional training.

Postpartum psychosis (or puerperal psychosis) is another severe mental illness. It affects around 1 in 500 mothers after giving birth. It starts suddenly in the days, or weeks, after having a baby. Symptoms vary, and can change rapidly. They can include high mood (mania), depression, confusion, hallucinations and delusions (Di Florio et al., 2013³⁹⁶; Heron et al., 2008³⁹⁷). Postpartum psychosis is a psychiatric emergency - women should seek help as quickly as possible. About one in 20 women may try to harm themselves or their baby. The risk for suicide can rise greatly for a year or longer after delivery. Appropriate detection of puerperal psychosis is needed to increase chances that a woman will receive adequate treatment, which could help to mitigate the global disease burden and improve maternal and newborn health.³⁹⁸

³⁹³ Grigoriadis S, VonderPorten EH, Mamisashvili L, Tomlinson G, Dennis CL, Koren G, Steiner M, Mousmanis P, Cheung A, Radford K, Martinovic J, Ross LE. The impact of maternal depression during pregnancy on perinatal outcomes: a systematic review and meta-analysis. J Clin Psychiatry. 2013 Apr;74(4):e321-41. <u>https://pubmed.ncbi.nlm.nih.gov/30192449/</u>

³⁹⁴ MBRRACE-UK (2020) Saving Lives, Improving Mothers' Care. Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2016-18<u>https://www.npeu.ox.ac.uk/assets/downloads/mbrrace-uk/</u> reports/maternal-report-2020/MBRRACE-UK_Maternal_Report_Dec_2020_v10_ONLINE_VERSION_1404.pdf

³⁹⁵ Health Information and Quality Authority (2016) Background document to support the development of National Standards for Safer Better Maternity Services <u>https://www.hiqa.ie/sites/default/files/2017-02/Maternity-Background-Document.pdf</u>

³⁹⁶ Florio A, Di, Smith S, Jones I, Postpartum psychosis. The Obstetrician & Gynaecologist 2013; 15: 145- 50. <u>https://obgyn.onlinelibrary.wiley.com/action/showCitFormats?doi=10.1111%2Ftog.12041</u>

³⁹⁷ Heron J, McGuinness M, Blackmore ER, Craddock N, Jones I. Early postpartum symptoms in puerperal psychosis. BJOG. 2008 Feb;115(3):348-53. doi: 10.1111/j.1471-0528.2007.01563.x. <u>https://pubmed.ncbi.nlm.nih.gov/18190371/</u>

³⁹⁸ VanderKruik, R., Barreix, M., Chou, D., Allen, T., Say, L., Cohen, L. S., & Maternal Morbidity Working Group (2017). The global prevalence of postpartum psychosis: a systematic review. BMC psychiatry, 17(1), 272. <u>https://doi.org/10.1186/s12888-017-1427-7</u>

FIVE: SAFE USE OF MEDICATION

Teratogenicity - the risk of congenital anomaly, that is, malformations at birth - is a major concern with regard to the safety of medicines during pregnancy. During the first trimester of pregnancy, the embryo undergoes rapid growth and is therefore extremely vulnerable to environmental hazards and toxic substances.^{399,400} Exposure during late pregnancy may also cause neurodevelopmental effects, which is of increasing concern. Consequently, pregnant women and health workers should have the appropriate knowledge to support safe medication use during pregnancy and breastfeeding.

More than 5 million women get pregnant in the EU every year and a majority take at least one medication during pregnancy. Yet there is almost no evidence-based information available on most medications to guide a woman and her healthcare professional's fully informed decisions regarding medication. Even less information is available regarding medication exposure through breastfeeding. In 2010, about 140,000 foetuses and babies in the EU-27 had a major birth defect.⁴⁰¹ Birth defects are estimated to have accounted for 11% of neonatal deaths in Europe in 2008.

Promoting healthy pregnancy and safe childbirth is a goal of all European healthcare systems. In real life, pregnant women become ill, and ill women become pregnant. Moreover, the trend of later age pregnancies and the higher prevalence of some chronic conditions, such as for example chronic hypertension, obesity, and diabetes result in a rapidly increasing proportion of pregnant women who need medications to treat their chronic disease during pregnancy. Women living with severe and chronic illness may need to take medications before, during and after pregnancy, but little to no adequate and well-controlled studies have been conducted to characterize the levels of maternal medications in human breast milk. The WHO recommends EBF for infants to six months of age to achieve optimal growth, development and health. However, with the dearth of scientifically-based information on medication transfer through breastfeeding, women may be counselled not to breastfeed if they are on a prescription medication, or a mother may decide to forgo postpartum treatment of her illness in favour of breastfeeding her baby.

Uncontrolled disease in pregnancy can lead to suffering and irreversible damage to the mother and for some conditions may also be harmful to the foetus. Therefore, it is surprising how little information is available about the use of medicines during pregnancy to determine the risks to both mother and child. Despite findings that 90% of pregnant women in high-income countries take medicines during their pregnancy (for chronic disease, to treat infections, or pregnancy complications, or when they do not yet know they are pregnant), approximately 90% of medications currently have no information about their potential to cause birth defects.^{402,403}

The safe use of medication during pregnancy is an unmet medical and societal need. Findings from the Innovative Medicines Initiative (IMI) ConcePTION⁴⁰⁴ study reported that 85% of women surveyed across 74 countries reported a need for information about medicines during pregnancy

³⁹⁹ EUROmediCAT, 2011, *What is EUROmediCAT*? <u>https://www.euromedicat.eu/whatiseuromedicat</u>

⁴⁰⁰ Farlex, 2016. Organogenesis. Available at: http://medicaldictionary.thefreedictionary.com/organogenesis.

⁴⁰¹ Zeitlin J1, Mohangoo AD, Delnord M, Cuttini M; EURO-PERISTAT Scientific Committee, 2013, "The second European Perinatal Health Report: documenting changes over 6 years in the health of mothers and babies in Europe," *J Epidemiol Community Health*, 67(12): 983-985. doi: 10.1136/jech-2013-203291. <u>https://pubmed.ncbi.nlm.nih.gov/24052513/</u>

⁴⁰² Lo WY1, Friedman JM, 2002, "Teratogenicity of recently introduced medications in human pregnancy," *Obstet Gynecol*, 100(3): 465-73. <u>https://pubmed.ncbi.nlm.nih.gov/12220765/</u>

⁴⁰³ EUROmediCAT, 2011, What is EUROmediCAT? https://www.euromedicat.eu/whatiseuromedicat

⁴⁰⁴ Conception Publications <u>https://www.imi-conception.eu/papers/</u>

and/or lactation. One in five women had difficulties understanding information given, commonly citing that the available information given was not precise enough. **Women and their physicians need comprehensive safety information to make informed decisions about medication use during pregnancy and breastfeeding in order to protect the health of women and their children during pregnancy, and prevent birth defects from happening in the first place.**

In Europe, very few medicines are authorised explicitly for use in pregnancy and breastfeeding. This is due to the limited knowledge and understanding of the risks that medicine use may pose. Tragic outcomes of *Thalidomide* use in the late 1950s and early 1960s as a treatment for morning sickness resulted in a ban on pregnant women and women of child-bearing age from participating in clinical trials. To-date, pregnant and lactating women are mostly excluded from clinical trials.⁴⁰⁵ Underrepresentation of this population in clinical trials has persisted, despite growing research that sex and gender impact on pharmaceutical outcomes differently,^{406,407} with one study quoted as that the "*male bias within pharmaceutical research, regulation and commercialisation needs to be rectified.*"⁴⁰⁸ The lack of consideration of sex and gender in the implementation of pharmaceutical research and regulations, as well as in the sex-disaggregated reporting of clinical trial findings,⁴⁰⁹ has left notable gaps in understanding of sex and gender differences in medicines as well as the effects of pregnancy on taking medicines.^{410,411}

Consequently, only about 5% of available medications have been adequately monitored, tested and labelled for use in pregnant and breastfeeding women.⁴¹² Instead, most medicines prescribed for pregnant women are either counter-indicated or used off-label. For some medicines, pregnancy registries have been established; however they are generally too small and do not have sufficient power to detect moderate medication-related congenital anomaly risk.⁴¹³ Moreover, **the uncertainty about how to balance potential risks to the baby against the known benefits to the mother challenges informed choice and decision-making**. In addition, questions can arise as to whether pregnancy should lead to changes in the dosage of medicines. Various initiatives at the EU-level are seeking to address the dearth of research that has been done in this area.⁴¹⁴

The IMI ConcePTION Project

The field, while inherently difficult to study, has suffered from a dearth of systematically gathered insights that could lead to more effective data generation methodologies. Rigorous, systematic

⁴⁰⁵ Shields KE, Lyerly AD. Exclusion of pregnant women from industry-sponsored clinical trials. Obstet Gynecol2013;122:1077-81. doi:10.1097/AOG.0b013e3182a9ca67. pmid:24104789 <u>https://pubmed.ncbi.nlm.nih.gov/24104789/</u>

⁴⁰⁶ Anderson GD. Gender differences in pharmacological response. Int Rev Neurobiol. 2008;83:1-10. doi: 10.1016/S0074-7742(08)00001-9. <u>https://pubmed.ncbi.nlm.nih.gov/18929073</u>

⁴⁰⁷ Rademaker M. Do women have more adverse drug reactions? Am J Clin Dermatol. 2001;2(6):349-51. doi: 10.2165/00128071-200102060-00001. <u>https://pubmed.ncbi.nlm.nih.gov/11770389/</u>

 ⁴⁰⁸ Zucker, I., Prendergast, B.J. Sex differences in pharmacokinetics predict adverse drug reactions in women. Biol Sex Differ 11, 32 (2020). https://bsd.biomedcentral.com/articles/10.1186/s13293-020-00308-5 Mauvais-Jarvis, F., Bairey Merz, N., Barnes, P. J., Brinton, R. D., Carrero, J. J., DeMeo, D. L., De Vries, G. J., Epperson, C. N., Govindan, R., Klein, S. L., Lonardo, A., Maki, P. M., McCullough, L. D., Regitz-Zagrosek, V., Regensteiner, J. G., Rubin, J. B., Sandberg, K., & Suzuki, A. (2020). Sex and gender: modifiers of health, disease, and medicine. Lancet (London, England), 396(10250), 565-582. https://doi.org/10.1016/S0140-6736(20)31561-0

⁴⁰⁹ Ravindran T S, Teerawattananon Y, Tannenbaum C, Vijayasingham L. Making pharmaceutical research and regulation work for women BMJ 2020; 371 :m3808 doi:10.1136/bmj.m3808 <u>https://www.bmj.com/content/371/bmj.m3808</u>

⁴¹⁰ Anderson GD. Gender differences in pharmacological response. Int Rev Neurobiol. 2008;83:1-10. doi: 10.1016/S0074-7742(08)00001-9. <u>https://pubmed.ncbi.nlm.nih.gov/18929073</u>

⁴¹¹ Anderson GD. Pregnancy-induced changes in pharmacokinetics: a mechanistic-based approach. Clin Pharmacokinet. 2005;44(10):989-1008. doi: 10.2165/00003088-200544100-00001. <u>https://pubmed.ncbi.nlm.nih.gov/16176115/</u>

⁴¹² Allegaert K. Pharmacotherapy during Pregnancy, Childbirth, and Lactation. Int J Environ Res Public Health. 2022 Sep 9;19(18):11336. doi: 10.3390/ijerph191811336. PMID: 36141608; PMCID: PMC9517125.

⁴¹³ EUROmediCAT (2011) What is EUROmediCAT? <u>http://www.euromedicat.eu/whatiseuromedicat</u>.

⁴¹⁴ European Medicines Agency (2020) Workshop on benefit-risk of medicines used during pregnancy and breastfeeding <u>https://www.</u> ema.europa.eu/en/documents/report/report-workshop-benefit-risk-medicines-used-during-pregnancy-breastfeeding_en.pdf

pharmacovigilance reporting as well as monitoring of the effect of the drug, including efficacy and adverse events is lacking. Currently, fragmentation and misinformation abound, resulting in confusing and contradictory communication and perception of risks by both health professionals, women and their families. The availability of more detailed and reliable information related to the safety and effectiveness of medications in pregnancy and breastfeeding may assist healthcare professionals and patients in making more evidence-based decisions.

ConcePTION is a 5-year European research project supported by the Innovative Medicines Initiative (IMI), a public-private partnership between the European Union and the European pharmaceutical industry.⁴¹⁵ It brings together 88 public and private organisations, including universities and researchers from 22 countries. The ConcePTion research project objective is to help bridge the knowledge gap about the safety of medicines in pregnancy and breastfeeding. **ConcePTION will create a trusted biomedical ecosystem that can effectively, systematically, and in an ethically responsible manner, generate reliable evidence-based information regarding the safety of medications used during pregnancy and breastfeeding. The European Institute of Women's Health is a member of the Project's Managing Board, and is also involved in four different Work Packages of the ConcePTION project.⁴¹⁶**

European Medicines Agency Strategy

Europe lacks a robust and comprehensive regulatory and information system that addresses safe medicine use during pregnancy. In order to improve maternal health and the health of future generations, reliable and up-to-date information should be available and easily accessible to women who are planning to become pregnant or are already pregnant, as well as being accessible to the health professionals who advise them. The European Medicines Agency (EuMedA) is in the process of drafting a strategy for better research into the benefits and risks of medicines in pregnancy and breastfeeding. The aim of the strategy is to obtain evidence on the use and safety of medicines for pregnant women, and to enable better decision-making on medical treatment for women who are planning to have a baby, are pregnant, or wish to breastfeed their baby.⁴¹⁷

A 2020 workshop held by the EuMedA discussed the benefit-risk of medicines used during pregnancy and breastfeeding. Objectives of the workshop included gathering input for the draft EuMedA strategy on drug safety in pregnancy and breastfeeding, and to discuss how to implement the report: 'EuMedA strategy towards obtaining evidence on medicine utilisation and safety for pregnant and breastfeeding women'. Recommendations outlined by key stakeholders at the workshop included:

- Sustainable investment and development of a multi-national infrastructure for routine and denova collection and analysis methods for pregnancy and breastfeeding to inform evidencebased decisions for treatment options during pregnancy and breast-feeding:
 - This should increase available data on the risk/benefit of medicines in pregnant and breastfeeding women throughout a medicine's lifecycle by optimising systematic collection and analysis of data from the multiple, routine interactions between women and their healthcare professionals;

⁴¹⁵ <u>https://www.imi-conception.eu</u>

⁴¹⁶ European Institute of Women's Health <u>https://www.eurohealth.ie</u>

⁴¹⁷ European Medicines Agency (2020) Workshop on benefit-risk of medicines used during pregnancy and breastfeeding <u>https://</u><u>www.ema.europa.eu/en/documents/report/report-workshop-benefit-risk-medicines-used-during-pregnancy-breastfeeding</u> <u>en.pdf</u>

- 2. Furthermore whilst some early stages of medicines may be justified in their exclusion of this population their participation in clinical trials must be considered "*more routinely*";
- 3. Such infrastructure should make cohesive use of relevant initiatives such as: EUROmediCAT, **ConcePTION**, CONSIGN, as well as additional population-based cohorts.
- Such information sources are key to support trust and communication between healthcare professionals and their patients to ensure that they are empowered to make informed decisions throughout all stages of breastfeeding and pregnancy, including planned and accidental exposure in unplanned pregnancies

Having undergone the final public consultation phase, the EuMedA developed dedicated guidance for post-authorisation monitoring of medicines in pregnant and breast-feeding women, as part of a new guideline on good pharmacovigilance practices module; as well as developing a strategy to support evidence-based generation of information on the benefits and risks of medicines in pregnancy and breastfeeding.

As a whole the framing of the recommendations put forward by the EuMedA reflect a change in mind-set towards women-centred care: implementation of recommendations were called upon to support a change in focus amongst stakeholders not just on the risks of medicines to the unborn baby; but within the broader context of maternal health and disease which considers benefits to the mother, as well as the risks to both mother and baby of not taking medications.⁴¹⁸

⁴¹⁸ EMA Regulatory Science Strategy <u>https://www.ema.europa.eu/en/about-us/how-we-work/regulatory-science-strategy</u>

Section Two: Maternal Health Care Context

ONE: SOCIO-ECONOMIC SUPPORT AROUND THE TIME OF BIRTH

Socio-economic support around the time of birth relates to the legal and socio-economic conditions prevailing in the jurisdiction in which women reside, regarding their employment and social security provisions and entitlements around the time of birth. More recent focus has extended these provisions to fertility and infertility, the legislative articulation of which is still in its infancy. While socio-economic support around the time of birth is articulated in legal and policy documents, in practice, much discrimination can take place for mothers in the workplace.

Legal Context

EU gender equality law has been transposed within the domestic laws of the 28 Member States of the European Union, as well as Iceland, Liechtenstein and Norway (the EEA countries) and four candidate countries (the Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Turkey). A report by the European Equality Law Network (2019), drawing on country reports from gender equality legal experts, details the implementation of these laws across Member States from the EU gender equality acquis.⁴¹⁹

The term 'EU gender equality acquis' refers to all the relevant EU Treaty and EU Charter of Fundamental Rights provisions, legislation and the case law of the Court of Justice of the European Union in relation to gender equality. Steps towards the current legal context of gender equality in the EU have included:

- In 1957, the Treaty establishing the European Economic Community (EEC), the origin of the current EU, contained only one single provision (Article 119 EEC Treaty, now Article 157 Treaty on the Functioning of the European Union (TFEU)) on gender discrimination: the principle of equal pay between men and women for equal work.
- Since then, many directives (a legislative act setting out a goal for EU countries with countries devising their own laws to meet them) have been adopted which prohibit discrimination on the grounds of sex:
 - the Directive on equal pay for men and women (75/117/EEC)
 - the Directive on equal treatment of men and women in employment (76/207/EEC), amended by Directive 2002/73/EC and now repealed by Recast Directive (2006/54/EC)
 - the Directive on equal treatment of men and women in statutory schemes of social security (79/7/EEC)
 - the Directive on equal treatment of men and women in occupational social security schemes (86/378/EEC), amended by Directive 96/97/EC and now repealed by Recast Directive (2006/54/EC)
 - the Directive on equal treatment of men and women engaged in an activity, including agriculture, in a self-employed capacity (86/613/EEC, repealed by Directive 2010/41/EU)
 - the Pregnant Workers' Directive (92/85/EEC)

⁴¹⁹ Publications Office of the European Union (2018) Gender Equality Law in Europe <u>https://op.europa.eu/en/publication-detail/-/</u> publication/9b101483-3a44-11e9-8d04-01aa75ed71a1

- the Parental Leave Directive (96/34/EEC), repealed by Directive 2010/18/EU)
- the Directive on equal treatment of men and women in the access to and the supply of goods and services (2004/113/EC)
- the Recast Directive (2006/54/EC).

Since the entry into force of the Lisbon Treaty on 1 December 2009, the European Community and the EU have merged into one single legal order, the European Union. However, we continue to work with two treaties: the Treaty on European Union (TEU) that lays down the basic structures and provisions, and the TFEU, which is more detailed and elaborates the TEU. In addition, the Charter of Fundamental Rights of the EU entered into force in 2009 and has the same legal value as the two Treaties (the TEU and the TFEU). The TEU, the TFEU and the Charter all contain provisions that are relevant to the field of gender equality.

Implementation of these treaties relates to equal pay and equal treatment at work; and during pregnancy; maternity, paternity, parental and other types of leaves related to work-life balance; occupational pension schemes; statutory schemes of social security; self-employed workers; goods and services; violence and domestic violence; enforcement and compliance. EU laws are transposed into national jurisdictions to prevent discrimination related to pregnancy and maternity, including law on the books and law in practice, with challenges relating to the exercise of the law in relation to equality. Types of pregnancy and maternity discrimination include direct, indirect, multiple and intersectional sex discrimination:

- Direct discrimination is alternative treatment to a person in a similar situation, because of pregnancy or maternity
- Indirect discrimination occurs when a policy that universally applies for all people disadvantages a specific group
- Multiple discrimination is discrimination which is based on two or more separate grounds simultaneously
- Intersectional discrimination, is closely related to multiple discrimination but is distinct in that one or more grounds of discrimination interact to produce a new and different type of discrimination.

In pursuit and in support of balance between work and family/private life, Article 33 of the Charter of Fundamental Rights of the EU also guarantees a "*right to paid maternity leave and to parental leave*" and applies to all Member States when they are implementing Union Law. In practice, women should be entitled to 14 weeks minimum maternity benefits as directed by EU law. However there are gaps in this provision. Some countries have not amended their law to comply with Article 8 of Directive 2014/41/EU, including provision of rights and protections for minimum 14 weeks of maternity benefits for female self-employed workers, and female spouses and life partners of self-employed workers. All countries provide for some form of adoption leave, however eligibility for parental leave is not universally guaranteed within any Member State.⁴²⁰

Under EU law, and therefore within Member States, direct sex discrimination applies to any *"unfavourable treatment of a woman related to pregnancy or maternity leave"*. Such discrimination is prohibited according to Article 2(2c) of the Gender Recast Directive 2006/54/EC. The law

⁴²⁰ European Institute for Gender Equality (2019) Gender Equality Index 2019: Work-Life Balance. https://eige.europa.eu/areas/ eligibility-parental-leave-factsheets <u>https://eige.europa.eu/publications/gender-equality-index-2019-report/parental-leave-policies</u>

protects against negative discrimination, but is also structured to acknowledge that there are instances in which positive action should be taken to provide adequate and fair supports to women in the workplace, where their gender-based needs may differ and different treatment for women is justified. Therefore, discrimination against men does not apply to the provisions related to pregnancy and maternity (Directive 92/85/EEC and Article 28 of the Recast Directive above). There are further systematic positive actions supported by legal provisions: Article 157(4) TFEU allows positive action, which is described as having *"a view to ensuring full equality in practice between men and women in working life, the principle of equal treatment shall not prevent any Member State from maintaining or adopting measures providing for specific advantages in order to make it easier for the underrepresented sex to pursue a vocational activity or to prevent or compensate for disadvantages in professional careers." An example of this relates to quotas of women in the workplace.*

Across the EU, some Member States explicitly prohibit pregnancy and maternity as a form of direct sex discrimination, though other Member States have not explicitly codified this form of discrimination. Nevertheless, specific case laws consider pregnancy and maternity discrimination to be sex discrimination. Indirect sex discrimination is explicitly prohibited in EU countries.⁴²¹ However not all definitions used by Member States are fully aligned with the EU's concept of indirect sex discrimination, for example, in Hungary, where the discrepancies mean that protections as defined at the EU level may not be supported as intended within the Member State. Another instance where legal protections within EU law may apply to prohibiting discrimination of women is Directive 20014/113 which relates to equal treatment in relation to goods and services. The Directive may apply to pregnant and breastfeeding women, in that women have the right to be able to breastfeed in a restaurant. Although discrimination against women related to pregnancy or maternity is prohibited as above, it is at most codified in law and at the least perceived as sex discrimination in case law across the Member States. Despite ensured access to courts in the EU, in practice, gender equality litigation, such as for direct, or indirect sex discrimination, is rarely seen.

The importance of rights based approaches in practice is important. A study in 12 European countries from 2011 to 2012 examined sick leave prevalence in pregnancy to explore patterns of and reasons for sick leave during pregnancy on a multinational level, focusing both on medication use and differences in sick leave policies.⁴²² From an electronic questionnaire to 6686 women, 3385 (50.6%) had been on sick leave during pregnancy. The rates of sick leave varied across countries, ranging from 31.7%-34.8% in Sweden and the UK to 62.4%-71.3% in Norway, Serbia, Croatia and Poland. The most common reasons for being on sick leave were pregnancy complications (26.5%); pain in the neck, back or pelvic girdle (16.2%); and nausea and vomiting (16.0%). Women from countries with 'low' sick leave policies were less likely to have extensions of sick leaves compared with women from countries with 'medium' policies. Women using medications were more likely to be on sick leave, especially for acute illnesses. The differences in sick leave patterns across countries only partially reflected differences in sick leave policies, implying other national differences.

⁴²¹ European Commission (2016) Gender equality law in Europe. How are EU rules transposed into national law in 2016? <u>https://ec.europa.eu/newsroom/just/document.cfm?action=display&doc_id=42029</u>

⁴²² Truong BT, Lupattelli A, Kristensen P, et alSick leave and medication use in pregnancy: a European web-based studyBMJ Open 2017;7:e014934. doi: 10.1136/bmjopen-2016-014934 <u>https://bmjopen.bmj.com/content/7/8/e014934.abstract</u>

Human rights law is applicable specifically to child, prenatal and post-natal healthcare (FRA, 2015a)⁴²³ For example, the UN Convention on the Rights of the Child requires services that "*ensure appropriate prenatal and postnatal healthcare for mothers*" (Children's Rights Alliance, 2010).⁴²⁴ Pregnant and lactating women also are afforded similar rights under Article 12 (2) of the UN Convention on the Elimination of all Forms of Discrimination against Women (CEDAW).⁴²⁵ Rights are also enshrined in the United Nations by the Office of the High Commissioner for Human Rights, including the definition and scale of maternal mortality and morbidity, the right to life, the right to health, the right to education and information, and human rights based approaches to maternal morbidity and mortality. Initiatives and activities within the United Nations system as described in terms of normative policy development, services, and accountability.

Childcare

According to the OECD Family Database, formal early-education provision is on the increase across EU countries, with the majority of children enrolling in some form of education before age 5. The EU Statistics on Income and Living Conditions (EU-SILC) provides comparative data on the proportion of children aged 3-5 years in day care, pre-school or school both in full-time equivalent and head count terms (2013 figures). The UK is towards the bottom of this distribution with 73% in care/education or 50% in full-time equivalent, indicating that care for this age group is much more commonly part-time than in most other EU countries. In comparison, formal childcare usage in the EU for children up to the age of two (not necessarily targeted interventions aimed at the disadvantaged) shows wide variations in 2013. Nearly 70% of children have used some kind of formal childcare and/or early education provision in Denmark, and less than 10% were doing the same in the Czech Republic. Again, the UK is towards the bottom of this distribution with 30% in care/education or 15% in full-time equivalent. For early childcare services as well, care is much more commonly part-time than in other EU countries.⁴²⁶

The European Union Statistics on Income and Living Conditions (EU-SILC) allows for the computation of childcare usage rates by socio-economic position. There is wide variation in childcare usage between countries, but also within countries between socioeconomic groups. In almost all countries, children born to highly educated mothers are much more likely to use formal childcare than children born to mothers with less education. The inequality in formal childcare use is striking in the UK, where children from highly educated mothers are 6 times more likely to be enrolled than children from mothers with less education.

An examination of maternal employment and the cost of childcare in Ireland by the ESRI⁴²⁷ notes that high childcare costs are linked to lower employment among mothers, with a 10% per cent increase in childcare costs leading to 30 minutes less paid employment per week for mothers. Lone parents spend more of their income on childcare costs (16%), as do low income families (20%), than the average across all families (12%).

⁴²³ Fundamental Rights Agency. (2015). Cost of exclusion from healthcare – The case of migrants in an irregular situation: Summary. <u>https://fra.europa.eu/sites/default/files/fra_uploads/fra-2015-cost-healthcare-summary_en.pdf</u>

⁴²⁴ United Nations Office of the High Commissioner for Human Rights. Preventable maternal mortality and morbidity and human rights https://www.ohchr.org/Documents/Issues/Women/WRGS/Health/ReportMaternalMortality.pdf

⁴²⁵ Convention on the Elimination of all forms of Discrimination of Violence Against Women New York, 18 December 1979 <u>https://</u> www.ohchr.org/en/instruments-mechanisms/instruments/convention-elimination-all-forms-discrimination-against-women

⁴²⁶ Flash Report, Coverage of Childcare in the European Union, 2015: European Social Policy Network <u>http://ec.europa.eu/social/</u> <u>main.jsp?catld=1135&langld=en</u>

⁴²⁷ Russell et al (2018) Maternal Employment And The Cost Of Childcare In Ireland <u>https://www.esri.ie/system/files/publications/</u> <u>rs73.pdf</u>

"The study finds that working arrangements for mothers with young children are dynamic and more complex than the choice between working full-time and staying at home. When children were between the ages of 3 and 5 years almost half of mothers (45%) changed their employment hours, including 9% who left employment, and 7% who entered employment."

Parenthood increases the scope of unpaid work in households and tends to depress women's employment rates relative to men's. Through an analysis of panel data from 28 EU Member States for the 2005-15 period, greater use of full-time childcare arrangements for children under the age of 3 were associated with smaller differences between employment rates of men and women with one, two, or three or more children under 6 years of age.⁴²⁸ Indeed, both institutional and workplace arrangements supporting the dual-earner/dual-caregiver family model are associated with more egalitarian gender-role attitudes. This is particularly true concerning availability of formal childcare for 0- to 3-year-olds, as well as work-schedule flexibility, as they enable a combination of care and paid work for both men and women.⁴²⁹ Individual and household characteristics are more relevant in determining mothers' employment in countries where the state is less supportive towards maternal employment, for example Italy and Germany.⁴³⁰ Overall, maternal employment is still below the overall EU recommended level of 60% in many European countries. Understanding the individual, household and contextual circumstances under which mothers of children of different ages are likely to be employed is crucial.

The provision of child health care is similarly diverse. A 2016 publication on diversity of child health care in Europe,⁴³¹ explains that the field of paediatrics in Europe is characterized by diversities, variations, and heterogeneities of child health care services in 53 European countries and more than 200 million children below 18 years of age. Managing the health care of infants, children and adolescents in Europe requires balancing clinical aims, research findings, and socioeconomic goals within a typical environment characterized by cultural and economic complexity and large disparity in availability, affordability, and accessibility of paediatric care. These disparities also connect to those related to the provision of childcare and policies supporting women returning to work after childbirth.

Returning to Work after Childbirth

Support for work-life balance is articulated in EU legislation. The social policy of the European Union in relation to work-life balances is specifically governed by Directive (EU) 2019/1158 of the European Parliament and of the Council of 20 June 2019 on work-life balance for parents and carers, repealing Council Directive 2010/18/EU. Data at the European level is contained with the European Survey on Income and Living Conditions, and the European Working Conditions Survey. It is beyond the scope of this report to analyse the data directly, relying instead on findings from other published works.⁴³²

⁴²⁸ Ana Marija Sikiric (2021) The Effect of Childcare Use on Gender Equality in European Labor Markets, Feminist Economics, 27:4, 90-113, DOI: 10.1080/13545701.2021.1933560 <u>https://www.tandfonline.com/doi/abs/10.1080/13545701.2021.1933560</u>

⁴²⁹ Lomazzi, Vera, Sabine Israel, and Isabella Crespi. 2019. "Gender Equality in Europe and the Effect of Work-Family Balance Policies on Gender-Role Attitudes" Social Sciences 8, no. 1: 5. <u>https://doi.org/10.3390/socsci8010005</u> Gender-role attitudes and microlevel controls are taken from the Eurobarometer for all 28 EU members. Macro-indicators were derived from Eurostat, European Quality of Work Survey, and the Organisation for Economic Cooperation and Development (OECD).

⁴³⁰ Dotti Sani, G. M., & Scherer, S. (2018). Maternal Employment: Enabling Factors in Context. Work, Employment and Society, 32(1), 75–92. <u>https://doi.org/10.1177/0950017016677944</u>

⁴³¹ Jochen Ehrich, MD, DCMT. Leyla Namazova-Baranova, MD. Massimo Pettoello-Mantovani, MD Introduction to "Diversity of Child Health Care in Europe: A Study of the European Paediatric Association/Union of National European Paediatric Societies and Associations" <u>https://www.jpeds.com/article/S0022-3476(16)30137-8/fulltext</u>

⁴³² Matilla-Santander et al (2019) Attitudes toward working conditions: are European Union workers satisfied with their working hours and work-life balance? Gac Sanit 33 (2) Mar-Apr 201905 Dec 2019 <u>https://www.scielosp.org/article/gs/2019.v33n2/162-168/en/</u>.

For women returning to work after childbirth, there are also discrepancies in well-being, worklife balance, and the interplay of supervisor support.⁴³³ Of 27 European countries participating in the 6th European Working Conditions Survey (EWCS-2015), findings demonstrated significant gender differences on the relative impact of work-life balance, supervisor support, and their interaction on perceived job well-being. The relevance of the human factor over human resource practices in addressing the difficulties that women returning to work face after childbirth is emphasised.⁴³⁴

A 2016 publication on the characteristics and indicators of work life balance focused on selected criteria as well as social life and time spent off work. These included the amount of stress, exhaustion and lack of time for family activities and responsibilities. Situated in Slovakia, stress and working hours were statistically significant factors that can be seen as obstacles in balancing and fulfilling family duties for many Slovaks. Furthermore, Slovak respondents performed much worse in the criteria of stress and lack of time results than the European average seen in the Eurofound survey.⁴³⁵

A comparative analysis, using cross-national data on 26 European countries, of the role of parenthood in shaping the gender wage gap estimated how parenthood contributes to the gender wage gap, also assessing how institutional elements affect this relationship.⁴³⁶ The authors found that irrespective of cultural norms and policies, fathers received a wage premium, which increased the gender gap. In contrast, motherhood gaps varied across countries, with the highest in Eastern European countries, where policies and norms lead to long absences from work. Moderate to small penalties were found in Continental Europe, Anglo-Saxon and Nordic countries, alongside higher maternal employment. No motherhood penalties were found for Southern EU countries, where mothers either returned to work quickly or else exited the labour market indefinitely.

Evidence from 11 European countries demonstrates that the over-representation of women in part-time jobs can explain the gender gap in hourly earnings. Using 2009 EU-SILC data for 11 European countries, the wage penalty of women employed part-time occurs mainly through the segregation of part-time jobs, but the full-time gender pay gap remains mostly unexplained. The gender wage gap tends to be higher in countries where part-time employment is more widespread. Some wage-setting institutions seem to reduce the female full-time/part-time pay gap and the gender gap among full-time workers.⁴³⁷

⁴³³ Lucia-Casademunt, A. M., García-Cabrera, A. M., Padilla-Angulo, L., & Cuéllar-Molina, D. (2018). Returning to Work after Childbirth in Europe: Well-Being, Work-Life Balance, and the Interplay of Supervisor Support. Frontiers in psychology, 9, 68. <u>https://doi.org/10.3389/fpsyg.2018.00068</u>

⁴³⁴ Barbara Beham, Sonja DrobniĐ, Patrick Präg, Andreas Baierl & Janin Eckner (2019) Part-time work and gender inequality in Europe: a comparative analysis of satisfaction with work-life balance, European Societies, 21:3, 378-402, DOI: 10.1080/14616696.2018.1473627 <u>https://www.tandfonline.com/doi/abs/10.1080/14616696.2018.1473627</u>

⁴³⁵ ŽivĐicová, E., Bulková, K., Masárová, T. (2017), Comparison of the Selected Indicators of Work Life Balance in European Union Countries, Economics and Sociology, Vol. 10, No. 1, pp. 222-231. DOI: 10.14254/2071-789X.2017/101/16 <u>https://pdfs.semanticscholar.org/6bfe/af077cf5c363f5ee63a19e8fafa7ccfc82a4.pdf</u>:

⁴³⁶ Ewa Cukrowska-Torzewska, Anna Lovasz, (2020) The role of parenthood in shaping the gender wage gap - A comparative analysis of 26 European countries, Social Science Research, Volume 85, 102355, ISSN 0049-089X, <u>https://doi.org/10.1016/j. ssresearch.2019.102355</u>.

⁴³⁷ Matteazzi, E., Pailhé, A., & Solaz, A. (2018). Part-time employment, the gender wage gap and the role of wage-setting institutions: Evidence from 11 European countries. European Journal of Industrial Relations, 24(3), 221-241. <u>https://doi.org/10.1177/0959680117738857</u>

TWO: DISPARITIES AND VULNERABLE POPULATIONS

Research commissioned by the European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs, at the request of the European Parliament's Committee on Women's Rights and Gender Equality in 2019, examined evidence on access of vulnerable social groups to maternal health care services and midwifery in the EU. Identified vulnerable groups were women with disabilities, migrant women (including undocumented), imprisoned women, and Roma women. Access to healthcare for vulnerable populations is affected by the interplay of health systems, legal systems, policies, socio-economic factors and attitudes of health professionals and users which create barriers to access leading to worse health outcomes for these groups.⁴³⁸

An estimated 500,000 women in the EU go through their first months of pregnancy with no access to health services. Health inequalities start early, in pregnancy, infancy and early childhood, and social determinants of health, that is, poverty, insecurity, discrimination, homelessness, inadequate housing, and lack of education, all play a substantial part. While infant mortality has decreased significantly in the European Union, some communities continue to be disproportionately affected. Women from migrant, refugee, and Roma communities and women living in poverty are particularly at risk.^{439,440} Health inequalities are a major cause of maternal mortality, which persist in the more affluent European Union, and manifest in terms of economic, geographic and cultural accessibility. A continuous effort by government and civil society is needed to address the social determinants of health and improve maternal health.⁴⁴¹

Poverty

The European Anti-Poverty Network has examined gender and poverty in Europe, adopting an approach which considers the feminisation of poverty, including aspects related to pregnancy. Women's poverty is impacted by job loss or change associated with events related to pregnancy, including needing time off for a termination. Broader discrimination related to pregnancy downgrades women's position in the labour market and contributes to lower socio-economic resources.⁴⁴²

Poverty is associated with adverse pregnancy outcomes. From a sample of 35 studies, a systematic review of socio-economic status and adverse pregnancy outcomes in the Republic of Ireland and the United Kingdom identified consistent evidence that lower occupational status, especially manual occupations and unemployment, are significantly associated with increased risk of multiple adverse pregnancy outcomes.⁴⁴³ Similarly, a study in the Netherlands found an association of neighbourhood socioeconomic trajectories with preterm birth and small-forgestational-age (SGA) via a nationwide population-based study. These trends can also be spatial. In the Netherlands, disadvantaged neighbourhoods were associated with higher odds of adverse

⁴³⁸ Policy Department for Citizens' Rights and Constitutional Affairs (2019) Access to maternal health and midwifery for vulnerable groups in the EU https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf

⁴³⁹ The European Child Guarantee: an opportunity to invest in early childhood development (2021) <u>https://epha.org/the-european-child-guarantee-an-opportunity-to-invest-in-early-childhood-development/</u>

⁴⁴⁰ Watson, H.L., Downe, S. Discrimination against childbearing Romani women in maternity care in Europe: a mixed-methods systematic review. Reprod Health 14, 1 (2017). <u>https://doi.org/10.1186/s12978-016-0263-4</u> <u>https://reproductive-health-journal. biomedcentral.com/articles/10.1186/s12978-016-0263-4</u>

⁴⁴¹ Meeting Patients' Needs In Maternal Health Care <u>https://ifair.eu/2020/08/30/meeting-patients-needs-in-maternal-health-care/</u>

⁴⁴² Graciela Malgesini (ES), Letizia Cesarini-Sforza (IT), Marija BaboviĐ (RS), with the contributions of Sonja Leemkuil (NL), Magnea Sverrisdóttir (IC) and Slavomíra Mareková (SK). (2017) Gender and Poverty in Europe. EAPN Briefing Note. Brussels: European Anti-Poverty Network.

⁴⁴³ Thomson K, Moffat M, Arisa O, et al Socioeconomic inequalities and adverse pregnancy outcomes in the UK and Republic of Ireland: a systematic review and meta-analysisBMJ Open 2021;11:e042753. doi: 10.1136/bmjopen-2020-042753 <u>https://bmjopen. bmj.com/content/11/3/e042753</u>

birth outcomes from low to medium showed higher odds of preterm birth. The odds of preterm or SGA birth in other areas were comparable to those seen in high SES areas. The authors recommend that strategies to improve pregnancy outcomes should incorporate approaches that address wider determinants of health to provide women and families with the best chances of having a healthy pregnancy and baby and to decrease pregnancy-related health inequalities in the general population.

In 2016, the Lancet published an analysis of global, regional and national levels of maternal mortality between 1990 and 2015, as a systematic analysis for the Global Burden of Disease (GBD) Study 2015. They identified trends according to socio-economic situations across a wide number of countries. Drawing on data from 186 countries, the authors quantified eight underlying causes of maternal death and four timing categories, and estimated adult all-cause mortality, HIV-related maternal mortality, and late maternal death. Secondary analyses allowed examination of drivers of trends, including the relation between maternal mortality and coverage of specific reproductive health-care services as well as assessment of observed versus expected maternal mortality as a function of socio-demographic indicators (SDI). Geographical disparities widened between 1990 and 2015 and, in 2015, 24 countries still had a maternal mortality ratio greater than 400. The proportion of all maternal deaths occurring in the bottom two SDI quintiles, where haemorrhage is the dominant cause of maternal death, increased from roughly 68% in 1990 to more than 80% in 2015. The middle SDI quintile improved the most from 1990 to 2015, but also has the most complicated causal profile. Maternal mortality in the highest SDI quintile is mostly due to other direct maternal disorders, indirect maternal disorders, and abortion, ectopic pregnancy, and/or miscarriage. Clear patterns were identified across a wide number of countries according to socio-demographic quintiles. Historical patterns suggest achievement of Sustainable Development Goal 3.1 will require 91% coverage of one antenatal care visit, 78% of four antenatal care visits, 81% of in-facility delivery, and 87% of skilled birth attendance.444

A number of factors are associated with poverty for women, such as ethnicity, lone motherhood, low household income, low household size, low educational level of women and marital status. The association of poverty with unplanned pregnancy and large household size points to a cycle that sustains poverty and leads to extreme poverty. Limited financial access to health care seems to mediate the association between women's poverty and low coverage with family planning as well as the lack of access to safe termination of pregnancy. Regarding access to health care, the major impact of poverty on women is limiting access to pharmaceuticals. The incapacity to afford the cost of health care appears as a central aspect of access to health care.⁴⁴⁵

Poverty among women is also associated with teenage pregnancies. In a study of the economic, ethnic and social background of teenagers before becoming teenage mothers or before having an induced abortion, a significant economic and social gradient for first-time teenage pregnancies was identified. Teenagers who had experienced family separation or who were formerly in out-of-home care had an increased risk of induced abortion or early childbearing. Teenage mothers were in a more disadvantaged position than pregnant teenagers who had an induced abortion.⁴⁴⁶

⁴⁴⁴ Kassebaum, Nicholas J et al. (2015) Global, regional, and national levels of maternal mortality, 1990-2015: a systematic analysis for the Global Burden of Disease Study. The Lancet, Volume 388, Issue 10053, 1775 - 1812 <u>https://www.thelancet.com/journals/ lancet/article/PIIS0140-6736(16)31470-2/fulltext</u>

⁴⁴⁵ Craveiro, I., Ferrinho, P., de Sousa, B. and Gonçalves, L. (2013) Healthcare access and the patterns of maternal health care utilization among poor and non-poor women living in urban areas in Portugal. *Health*, 5, 1954-1964. doi: 10.4236/health.2013.512265.

⁴⁴⁶ Mogens Nygaard Christoffersen and M. Azhar Hussain (2008) Teenage Pregnancies: Consequences Of Poverty, Ethnic Background, And Social Conditions: A longitudinal study of motherhood and induced abortion among 14 to 19 year old women born in 1981. The Danish National Institute of Social Research. https://ec.europa.eu/migrant-integration/sites/ default/files/2010-05/docl_14043_177564206.pdf

Indeed, literature on poverty and pregnancy is for the most part associated with the bi-directional connection between poverty and teenage pregnancy, rather than a broader examination of poverty and maternal health.

Socioeconomic position is also inversely associated with stillbirth risk.⁴⁴⁷ A piece of research aimed to assess the impact on national rates in Europe, by calculating the magnitude of social inequalities in stillbirth rates in European countries using indicators generated from routine monitoring systems. The median RR of stillbirth for women with primary and lower secondary education compared to women with postsecondary education was 1.9 and 1.4, respectively. For mothers' occupations, the median RR comparing outcomes among manual workers with managers and professionals was 1.6, whereas for fathers' occupations, the median RR was 1.4. 25% of stillbirths would not have occurred if stillbirth rates for all women were the same as for women with post-secondary education in their country.

An Italian study examined how maternal care was affected by socioeconomic factors. It analysed the effect of maternal education, employment and citizenship on antenatal and post-natal indicators. The study showed that education and employment status affect maternal care in both migrant and Italian women, with a stronger impact on migrant women. It was recommended that policies addressing inequalities in ante- and post-natal care should specifically target these underlying socioeconomic inequalities. It was suggested that interventions focus on women's empowerment and take into account the specific life/work difficulties of migrants to Italy, so as to improve the maternal care even among most disadvantaged women (Lauria et al., 2013).⁴⁴⁸

The British Medical Association, in a 2018 study examining health inequities and women in the United Kingdom, set out key messages that there are clear and stark inequalities in health between women, which are related to socio-economic status, ethnicity and geographic region. Across different stages of women's lives there are different social and economic factors which drive health and associated health inequalities; including experiences during early childhood, education, family building and working life and through retirement and into older age. The broad health workforce must take full account of the social and economic factors which shape women's lives and health at different stages of life.

Migrant and Refugee Status

Definitions

Migrant: An individual who moves from their initial country of settlement to a different one. The move can be the result of a voluntary decision (e.g. to find gainful employment) or the result of adverse social, economic and political conditions in the country of origin. This category includes subgroups such as refugees, settlers, circular migrants or transit migrants. Migrants may remain in the host country ('settlers'), or reside provisionally in a country aiming to move to another country ('transit migrants'), or move back and forth between countries ('circular migrants', such as seasonal workers).

Refugee: An individual who, owing to war, natural disaster, or fear of persecution for reasons of race, religion, nationality, or political beliefs, has been forced to leave the country of initial settlement and is unable or unwilling to return there.

⁴⁴⁷ Zeitlin, J., Mortensen, L., Prunet, C. et al. Socioeconomic inequalities in stillbirth rates in Europe: measuring the gap using routine data from the Euro-Peristat Project. BMC Pregnancy Childbirth 16, 15 (2016). <u>https://doi.org/10.1186/s12884-016-0804-4</u>

⁴⁴⁸ Ward M, Kristiansen M, Sørensen K. Migrant health literacy in the European Union: A systematic literature review. Health Education Journal. 2019;78(1):81-95. doi:10.1177/0017896918792700

Asylum seeker: An individual who is seeking international protection and sanctuary in a country other than the one of their usual settlement. In countries with formal institutional procedures, an asylum seeker makes a formal application for protection and their claim is granted or rejected.

Undocumented migrant: An individual who lives in a foreign country without the legal right to stay (valid residence permit or visa) and who can be faced with deportation. This category includes asylum seekers whose claim has been rejected, people who overstayed their expired visa and those who entered the country by illegal means"⁴⁴⁹

Migrant women, particularly undocumented migrant women, often face unique health needs related to maternal health, sexual and reproductive health, and violence (WHO Europe, 2018; Smith et al, 2016). Pregnant women who are migrants have poorer pregnancy outcomes than non-migrant women and often lack access to necessary care (Smith et al, 2016). Children who are migrants are also particularly vulnerable to diseases like gastrointestinal and respiratory illness (WHO Europe, 2018).⁴⁵⁰

Apart from poverty, immigration status also generates disparities. Migrant women are at risk of poorer pregnancy outcomes.⁴⁵¹ Systematic evidence on migrant women's experiences of pregnancy, childbirth and maternity care in their destination European country, was generated through a systematic review including a final sample of 51 eligible studies. Studies were conducted in 14 European countries and focused on women described as migrants, refugees or asylum seekers. The evidence concluded that migrant women need culturally-competent healthcare providers who provide equitable, high quality and trauma-informed maternity care, undergirded by interdisciplinary and cross-agency team-working and continuity of care. Models of maternity care are needed which go beyond clinical care and address migrant women's unique socioeconomic and psychosocial needs.

The number of female migrants within the reproductive age category is rapidly increasing, which entails specific needs for maternal health services. A systematic review aiming to assess interventions and policies that improve the accessibility and quality of maternal health care for migrants in the WHO European Region, demonstrated that most migrant women have poorer maternal health outcomes than other women throughout the WHO European Region.⁴⁵² Identified risk factors are linked not only to pregnancy, childbirth and the postpartum period but also to events before conception. Restricted entitlement and problems with familiarity, knowledgeability, acceptability, availability and affordability jeopardize migrant women's access to maternal health care. Migrant women also have an excess risk of maternal mortality,⁴⁵³ with a higher risk of dying from direct than indirect death causes.

A systematic review of pregnancy and birth outcomes among immigrant women in the US and Europe presented evidence that the prevalence of low birthweight among migrants varies by

⁴⁴⁹ European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs (2019) Access to maternal health and midwifery for vulnerable groups in the EU https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_ STU(2019)608874_EN.pdf

⁴⁵⁰ WHO. 2018. Migration and Heath: Key Issues. <u>https://www.euro.who.int/en/health-topics/health-determinants/migration-and-health/migration-and-health-migration-and-health-key-issues</u>

⁴⁵¹ Fair, F., Raben, L., Watson, H., Vivilaki, V., van den Muijsenbergh, M., Soltani, H., & ORAMMA team (2020). Migrant women's experiences of pregnancy, childbirth and maternity care in European countries: A systematic review. PloS one, 15(2), e0228378. <u>https://doi.org/10.1371/journal.pone.0228378</u>

⁴⁵² Keygnaert, Ines, Ivanova, Olena, Guieu, Aurore, Van Parys, An-Sofie, Leye, Els. et al. (Đ2016) D. What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. World Health Organization. Regional Office for Europe. <u>https://apps.who.int/iris/handle/10665/326306</u>

⁴⁵³ Pedersen GS, Grøntved A, Mortensen LH, Andersen AM, Rich-Edwards J. Maternal mortality among migrants in Western Europe: a meta-analysis. Matern Child Health J. 2014 Sep;18(7):1628-38. doi: 10.1007/s10995-013-1403-x. PMID: 24337813. <u>https://pubmed.ncbi.nlm.nih.gov/24337813/</u>

the host country characteristics as well as the composition of migrants to different regions. The primary driver of migrant health is the migrant "regime" in different countries at specific periods of time. Future health outcomes of immigrants will depend on the societal characteristics (legal protections, institutions and health systems) of host countries.⁴⁵⁴

Inequity in immigrants' health during pregnancy and childbirth has been shown.⁴⁵⁵ A Danish regional organization of public midwifery-based antenatal care (ANC) for immigrant women was a site for assessing the strengths and weaknesses of organizing ANC as either universal or immigrant-targeted. A telephone survey in 2012 to all the Danish maternity wards (n = 20) was conducted. Semi-structured interviews with midwives providing targeted care (n = 6) were undertaken and characteristics of care were qualitatively analysed, having the immigrant density of the facilities, the Danish ANC policy, and theories of cultural competence as the frame of reference. Six maternity wards were providing immigrant-targeted ANC. Targeted care implied longer consultations and increased attention to the individual needs of immigrant women. At these facilities, navigation in the health care system, body awareness, and use of interpreter services were key topics. A strategy could be to improve dynamic cultural competencies of midwives, interpreter services, and flexibility of the care provision of the universal ANC system.

Gieles et al. (2019), through a systematic review of the literature, found that several studies reported adverse outcomes among asylum seekers and undocumented migrants including higher maternal mortality (AS), severe acute maternal morbidity (AS), preterm birth (UM) and low birthweight (UM). The authors acknowledge that limited evidence is available on pregnancy outcomes in populations of asylum seekers and undocumented migrants in Europe. The adverse outcomes reported imply that removing barriers to high-quality maternal care should be a priority. More research focussing on migrant subpopulations, considering potential risk factors such as ethnicity and legal status, is needed to guide policy and optimize care.⁴⁵⁶

Undocumented migrants, in particular pregnant women and their newborns, constitute a particularly vulnerable group of migrants.⁴⁵⁷ Undocumented women underutilise essential maternal and child healthcare services, and experienced worse health outcomes.⁴⁵⁸ Undocumented migrants are hesitant to use services due to a lack of knowledge and fear of deportation and the status of undocumented migrants exacerbates known health risks and hampers service use.

There is evidence of obstetric outcomes for undocumented women. In a scoping review of health and access to care for undocumented migrants living in the European Union, Woodward et al.⁴⁵⁹ noted that literature on health and access to care for this population living within the European Union is limited, as well as heterogeneous in focus and quality. Major access barriers include fear,

⁴⁵⁴ Villalonga-Olives E, Kawachi I, von Steinbüchel N. Pregnancy and Birth Outcomes Among Immigrant Women in the US and Europe: A Systematic Review. J Immigr Minor Health. 2017 Dec;19(6):1469-1487. doi: 10.1007/s10903-016-0483-2.

⁴⁵⁵ Villadsen, Sarah F., Hodan J. Ims, and Anne-Marie Nybo Andersen. 2019. "Universal or Targeted Antenatal Care for Immigrant Women? Mapping and Qualitative Analysis of Practices in Denmark" International Journal of Environmental Research and Public Health 16, no. 18: 3396. <u>https://doi.org/10.3390/ijerph16183396</u> <u>https://www.mdpi.com/1660-4601/16/18/3396</u>

⁴⁵⁶ Noor C Gieles, Julia B Tankink, Myrthe van Midde, Johannes Düker, Peggy van der Lans, Catherina M Wessels, Kitty W M Bloemenkamp, Gouke Bonsel, Thomas van den Akker, Simone Goosen, Marcus J Rijken, Joyce L Browne, Maternal and perinatal outcomes of asylum seekers and undocumented migrants in Europe: a systematic review, European Journal of Public Health, Volume 29, Issue 4, August 2019, Pages 714-723, https://doi.org/10.1093/eurpub/ckz042

⁴⁵⁷ Keygnaert I, Ivanova O, Guieu A, Van Parys A-S, Leye E, Roelens K. What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (Health Evidence Network (HEN) synthesis report 45). <u>https://apps.</u> who.int/iris/bitstream/handle/10665/326306/9789289051576-eng.pdf?sequence=1&isAllowed=y

⁴⁵⁸ Lea de Jong, Milena Pavlova, Marjolein Winters, Bernd Rechel, A systematic literature review on the use and outcomes of maternal and child healthcare services by undocumented migrants in Europe, European Journal of Public Health, Volume 27, Issue 6, December 2017, Pages 990–997, <u>https://doi.org/10.1093/eurpub/ckx181</u>

⁴⁵⁹ Woodward, A., Howard, N., & Wolffers, I. (2014). Health and access to care for undocumented migrants living in the European Union: a scoping review. Health policy and planning, 29(7), 818-830. https://doi.org/10.1093/heapol/czt061

lack of awareness of rights, and socioeconomic situations. Mental health disorders appeared widespread, while obstetric needs and injuries were key reasons for seeking care. Pregnant women, children and detainees appeared most vulnerable.

Aiming to describe the use of maternal health care services and the obstetric outcomes of undocumented women in Helsinki, Finland,⁴⁶⁰ a retrospective register-based study consisted of data collected between 2014 to 2018 from the electronic medical records of the public maternity clinic and maternity hospital in Helsinki. The study population consists of 62 individual pregnancies of undocumented women. A majority (91%) of undocumented women attended public prenatal care. Undocumented women entered prenatal care later and had fewer visits compared with all pregnant women. The majority (71%) of undocumented women received inadequate prenatal care as the number of visits was less than eight. Of the study population, 5% (3/59) tested positive for HIV, 3% (2/59) for HBV, and 2% (1/57) for syphilis. The prevalence of HIV (p-value < 0.001) and HBV (p-value=0.007) was significantly higher amongst undocumented women compared with all pregnant women. Overall, undocumented women entered prenatal care later than recommended. Most women received inadequate prenatal care and some of them did not receive prenatal care at all. The prevalence of infectious diseases was significantly higher and the coverage of prenatal screenings deficient amongst undocumented pregnant women. These trends largely relate to experiences in their country of origin, cultural factors, violence experienced during the journey, among others.

Similarly, a study situated in Paris, France, found that undocumented migrants are the migrant subgroup at highest risk of severe maternal morbidity, even though the prevalence of risk factors does not appear to be higher in this subgroup. This finding suggests that their interaction with maternity care services may be sub-optimal. Undocumented migrants had resided for less time in France, experienced social isolation, linguistic barriers and poor housing conditions more frequently and had a pre-pregnancy medical history at lower risk than other migrants. They had a higher risk of severe maternal morbidity than non-migrants, which was significant for undocumented women from sub-Saharan Africa, and not for those born elsewhere.⁴⁶¹

An EC research grant entitled EU border care is a 5 year ERC starting grant *Intimate Encounters in EU Borderlands: Migrant Maternity, Sovereignty and the Politics of Care on Europe's Periphery.* Focused on France, Italy, Greece and Spain, the research analyses the personal and institutional relations of care and control in the context of pregnancy and childbirth and critiques the moral rationale underpinning healthcare delivery and migration governance.⁴⁶² Barriers identified in this study include language and communication with health professionals; health professionals' lack of experience in dealing with 'difference'; structural inequalities; organisational barriers; culture and faith; mental health; fear and social stigma. The presence of these barriers led to alternative health-seeking strategies, such as self-medication, contacting doctors in home countries and borrowing health insurance cards from Danish citizens.⁴⁶³

In addition to the report on vulnerable women in Europe, which includes migrants and ethnic minorities, Roma, prisoners and persons with disabilities, a separate report examines specifically the barriers in access to affordable maternal health care for undocumented migrant women

⁴⁶⁰ Tasa, J., Holmberg, V., Sainio, S. et al. Maternal health care utilization and the obstetric outcomes of undocumented women in Finland – a retrospective register-based study. BMC Pregnancy Childbirth 21, 191 (2021). <u>https://doi.org/10.1186/s12884-021-03642-7</u>

 ⁴⁶¹ Eslier M, Deneux-Tharaux C, Sauvegrain P, Schmitz T, Luton D, Mandelbrot L, Estellat C, Azria E. Severe maternal morbidity among undocumented migrant women in the PreCARE prospective cohort study. BJOG. 2022 Feb 14. doi: 10.1111/1471-0528.17124.
⁴⁶² EL Perder Care http://ouberdercare.ou/

⁴⁶² EU Border Care: <u>http://eubordercare.eu/</u> ⁴⁶³ Biswas D. Kristianson M. Krasnik A. et al. Ace

⁴⁶³ Biswas, D., Kristiansen, M., Krasnik, A. et al. Access to healthcare and alternative health-seeking strategies among undocumented migrants in Denmark. BMC Public Health 11, 560 (2011). https://doi.org/10.1186/1471-2458-11-560

in the European Union. Carried out by the Centre for Reproductive Rights, it takes a primarily legal approach, and covers the impact of cost barriers, the lack of effective firewalls, reporting obligations and additional legal and policy barriers.⁴⁶⁴ Undocumented migrant women living in Europe face considerable barriers in access to reproductive health care and many European countries maintain discriminatory legal and policy restrictions that deny them equal access to affordable maternal health care throughout pregnancy and childbirth.

Watson and Downe (2017) reviewed the published evidence on discrimination against Romani women in maternity care in Europe.⁴⁶⁵ Ten studies revealed that many Romani women encounter barriers to accessing maternity care. Even when they are able to access care, Romani women can experience discriminatory mistreatment on the basis of their ethnicity, economic status, place of residence or language. The grey literature search revealed some health professionals held underlying negative beliefs about Romani women. There were no published research studies examining the effectiveness of interventions to address discrimination against Romani women and their infants in Europe. Interventions to address discrimination against childbearing Romani women and underlying health provider prejudice are urgently needed, alongside analysis of factors predicting the success or failure of such initiatives.

Adolescents

There are minimum age requirements with respect to the rights of the Child in E.U. and the age at which children can access reproductive and sexual health services without parental consent.^{466,467} Factors such as culture and welfare state provision play a role. Michaud et al, 2020 asks whether European Union Countries adequately address the healthcare needs of adolescents in the area of sexual reproductive health rights⁴⁶⁸ and the WHO examines the "*situation of child and adolescent health in Europe*."⁴⁶⁹ In a substantial part of Europe, access to healthcare and programmes specifically dedicated to pregnant adolescents is limited, as is access to free contraception. Health services providing SRH adolescent-friendly care and respecting adolescents' rights (e.g., confidentiality and autonomy) are not available in nearly half of European Union countries. In many situations, health professionals providing SRH to adolescents are not trained to meet adolescents' SRH needs. "Oral contraception is delivered free of charge in only 10 countries. Twenty-three countries do not meet current standards in terms of providing policy-based pregnancy care, and only 13 have set up special programmes for pregnant adolescents." Poverty and inequality also intersect.^{470,471}

 ⁴⁶⁴ Perilous Pregnancies (2018) Barriers in Access to Affordable Maternal Health Care for Undocumented Migrant Women in the European Union <u>https://tbinternet.ohchr.org/Treaties/CCPR/Shared%20Documents/CRO/INT_CCPR_CSS_CRO_37141_E.pdf</u>
⁴⁶⁵ Watson, H. L., & Downe, S. (2017). Discrimination against childbearing Romani women in maternity care in Europe: a mixed-

Watson, H. L., & Downe, S. (2017). Discrimination against childbearing Romani women in maternity care in Europe: a mixedmethods systematic review. Reproductive health, 14(1), 1. <u>https://doi.org/10.1186/s12978-016-0263-4</u>
Alemán-Díaz AX Backhaus S. Siebers I.L. Chukwujama O. Eenski E. Henking CN. Kaminska K. Kuttumuratova A. Weber MW. Child

⁴⁶⁶ Alemán-Díaz AY, Backhaus S, Siebers LL, Chukwujama O, Fenski F, Henking CN, Kaminska K, Kuttumuratova A, Weber MW. Child and adolescent health in Europe: monitoring implementation of policies and provision of services. Lancet Child Adolesc Health. 2018 Dec;2(12):891-904. doi: 10.1016/S2352-4642(18)30286-4. Epub 2018 Nov 1. PMID: 30391208. <u>https://pubmed.ncbi.nlm.nih.gov/30391208/</u>

⁴⁶⁷ European Agency for Fundamental Rights (2017). Accessing reproductive or sexual health services. <u>https://fra.europa.eu/en/</u> <u>publication/2017/mapping-minimum-age-requirements/sexual-health-services</u>

⁴⁶⁸ Michaud P, Visser A, Vervoort J, et al. Do European Union countries adequately address the healthcare needs of adolescents in the area of sexual reproductive health and rights?Archives of Disease in Childhood 2020;105:40-46. <u>https://adc.bmj.com/ content/105/1/40</u>

⁴⁶⁹ "Situation of child and adolescent health in Europe. Copenhagen: World Health Organization, 2018:220. <u>http://www.euro.who.</u> <u>int/______data/assets/pdf______file/0007/381139/situation-child-adolescent-health-eng.pdf?ua=1</u>

⁴⁷⁰ Alliance for Maternal Health Equality (2018) Working hand in hand for maternal health equality in Europe <u>https://www.</u> <u>maternalhealthalliance.eu</u>

Intimate Partner Violence during Pregnancy

An EU-wide study found that one in five women (versus more than one in four women globally) has experienced physical and/or sexual violence in their lifetime from either a current or previous partner.^{472,473} Globally, figures range between 1-28% of women experiencing physical violence during pregnancy.⁴⁷⁴

EU Country-level studies report prevalence of domestic violence during pregnancy from 1.8% in France⁴⁷⁵ and 6% in Greece,⁴⁷⁶ to 11.1% in Eastern Turkey⁴⁷⁷ and as high as 22% in Portugal⁴⁷⁸ when assessing physical violence; and from 2% in Sweden⁴⁷⁹ to 10.6% in Belgium when including emotional/psychological, sexual and physical forms of violence.⁴⁸⁰

Several risk factors for violence during pregnancy have been identified in studies conducted across the European Union, which are supported by wider reviews.⁴⁸¹ Risk factors identified in EU studies include: history of violence and medical history, particularly any previous abortions; sociodemographic background including nationality, financial instability, and low educational attainment, as well as relationship factors, including being single/living apart, and a substantial age difference between partners.^{482,483,484,485} Furthermore, violence during pregnancy has several harmful impacts on both maternal and child health, during the pregnancy and the birth itself, as well as increasing the risk of lifelong health consequences.⁴⁸⁶ Ultimately, violence can lead to high social and economic costs not only for the people directly impacted by violence, but also for their families and societies.⁴⁸⁷

⁴⁷² European Union Agency for Fundamental Rights (2014) Violence against women: an EU-wide survey. Results at a glance<u>https://</u> <u>fra.europa.eu/sites/default/files/fra-2014-vaw-survey-at-a-glance-oct14_en.pdf</u>

⁴⁷³ Sardinha, L. et al. (2022) Global, regional, and national prevalence estimates of physical or sexual, or both, intimate partner violence against women in 2018. The Lancet. February 16, 2022 DOI: <u>https://doi.org/10.1016/S0140-6736(21)02664-7</u>

⁴⁷⁴ World Health Organization (WHO). Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines; 2013. p. 1-68 <u>https://apps.who.int/iris/bitstream/handle/10665/85240/9789241548595_eng.pdf</u>

⁴⁷⁵ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y

⁴⁷⁶ Antoniou E, latrakis G. Domestic Violence During Pregnancy in Greece. Int J Environ Res Public Health. 2019 Oct 31;16(21):4222. doi: 10.3390/ijerph16214222

⁴⁷⁷ Arslantaş H, Adana F, Ergin F, Gey N, Biçer N, KıranĐal N. Domestic Violence During Pregnancy in an Eastern City of Turkey: A Field Study. Journal of Interpersonal Violence. 2012;27(7):1293-1313. doi:10.1177/0886260511425248 <u>https://pubmed.ncbi.nlm.nih.gov/22080579/</u>

⁴⁷⁸ Almeida FSJ, Coutinho EC, Duarte JC, Chaves CMB, Nelas PAB, Amaral OP, Parreira VC. Domestic violence in pregnancy: prevalence and characteristics of the pregnant woman. J Clin Nurs. 2017 Aug;26(15-16):2417-2425. doi: 10.1111/jocn.13756. <u>https://pubmed.ncbi.nlm.nih.gov/28178385/</u>

⁴⁷⁹ Finnbogadóttir, H., Dykes, AK. & Wann-Hansson, C. Prevalence and incidence of domestic violence during pregnancy and associated risk factors: a longitudinal cohort study in the south of Sweden. BMC Pregnancy Childbirth 16, 228 (2016). <u>https://doi.org/10.1186/s12884-016-1017-6</u>

⁴⁸⁰ Van Parys AS, Deschepper E, Michielsen K, Temmerman M, Verstraelen H. Prevalence and evolution of intimate partner violence before and during pregnancy: a cross-sectional study. BMC Pregnancy Childbirth. 2014 Aug 28;14:294. doi: 10.1186/1471-2393-14-294. PMID: 25169813; PMCID: PMC4159505. <u>https://pubmed.ncbi.nlm.nih.gov/25169813/</u>

⁴⁸¹ James L, Brody D, Hamilton Z. Risk factors for domestic violence during pregnancy: a meta-analytic review. Violence Vict. 2013;28(3):359-80. doi: 10.1891/0886-6708.vv-d-12-00034. PMID: 23862304

⁴⁸² Antoniou E, latrakis G. Domestic Violence During Pregnancy in Greece. Int J Environ Res Public Health. 2019 Oct 31;16(21):4222. doi: 10.3390/ijerph16214222. <u>https://pubmed.ncbi.nlm.nih.gov/31683512/</u>

⁴⁸³ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y

⁴⁸⁴ Van Parys AS, Deschepper E, Michielsen K, Temmerman M, Verstraelen H. Prevalence and evolution of intimate partner violence before and during pregnancy: a cross-sectional study. BMC Pregnancy Childbirth. 2014 Aug 28;14:294. doi: 10.1186/1471-2393-14-294 <u>https://pubmed.ncbi.nlm.nih.gov/25169813/</u>

⁴⁸⁵ Finnbogadóttir H, Baird K, Thies-Lagergren L. Birth outcomes in a Swedish population of women reporting a history of violence including domestic violence during pregnancy: a longitudinal cohort study. BMC Pregnancy Childbirth. 2020;20(1):183. Published 2020 Mar 26. doi:10.1186/s12884-020-02864-5

⁴⁸⁶ Donovan BM, Spracklen CN, Schweizer ML, Ryckman KK, Saftlas AF (2016) Intimate partner violence during pregnancy and the risk for adverse infant outcomes: a systematic review and meta-analysis. BJOG. 2016 Jul; 123(8):1289-99. https://pubmed.ncbi. nlm.nih.gov/26956568/

⁴⁸⁷ WHO, LSHTM, SAMRC. Global and regional estimates of violence against women: prevalence and health impacts of intimate partner violence and non-partner sexual violence. WHO: Geneva, 2013. <u>https://www.who.int/publications/i/item/9789241564625</u>

Violence during pregnancy impacts on the health of women as well as how they interact with the healthcare system. Violence has several direct physical effects including injury and death. Impacts on mental health, included increased depression, sleep difficulties, post-traumatic stress and anxiety, amongst other mental health illnesses. Direct impacts on women's sexual and reproductive health are also reported such as increased risk of sexually transmitted infections such as HIV; risk of unintended pregnancies, miscarriages and other gynaecological problems. Maternal and child outcomes which are negatively impacted by a history of violence include, an increased risk of undergoing a C-section; as well as a significantly higher risk of stillbirth, preterm birth; and having a low-birth weight baby. Finally, experiencing violence has also been reported to impact on the way women interact with the health system including increasing their visits to emergency care for general medical care, and delaying their initiation of antenatal care during pregnancy.^{488,489,490,491,492}

Reporting on Violence in Pregnancy

Under the Istanbul Convention, physical, sexual, psychological and economic violence are considered in the definition of violence and domestic violence against women; as is used by the WHO. Reporting exact prevalence and risk factors of domestic violence during pregnancy for the European Union, as well as comparing figures at the country-level is challenging due to differences in methodological approaches used to assess violence, including variation in definitions of violence.⁴⁹³ For example, amongst some of the studies cited in this report Antoniou & Latrakis (2019) and Maciel *et al.* (2019) assessed the prevalence of physical violence during pregnancy.^{494,495} Whereas, studies from Sweden⁴⁹⁶ and Belgium⁴⁹⁷ reported on violence during pregnancy, defined as including physical, sexual and emotional violence. The WHO has also outlined fourteen key remaining gaps and challenges which must be addressed to ensure accurate, reliable and comparable data on violence against women:⁴⁹⁸ recommendations include the standardisation of measures and denominators, the need for data on intersecting forms of discrimination (for e.g. women with disabilities, and migrants), as well increased data on same-sex partners, amongst others.

⁴⁸⁸ Sardinha, L. et al. (2022) Global, regional, and national prevalence estimates of physical or sexual, or both, intimate partner violence against women in 2018. The Lancet. February 16, 2022 DOI: <u>https://doi.org/10.1016/S0140-6736(21)02664-7</u>

⁴⁸⁹ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y <u>https://pubmed.ncbi.nlm.nih.gov/31203524/</u>

⁴⁹⁰ WHO, LSHTM, SAMRC. Global and regional estimates of violence against women: prevalence and health impacts of intimate partner violence and non-partner sexual violence. WHO: Geneva, 2013. <u>https://www.who.int/publications/i/item/9789241564625</u>

⁴⁹¹ Donovan BM, Spracklen CN, Schweizer ML, Ryckman KK, Saftlas AF. Intimate partner violence during pregnancy and the risk for adverse infant outcomes: a systematic review and meta-analysis. BJOG. 2016 Jul;123(8):1289-99. doi: 10.1111/1471-0528.13928. https://pubmed.ncbi.nlm.nih.gov/26956568/

⁴⁹² Finnbogadóttir H, Baird K, Thies-Lagergren L. Birth outcomes in a Swedish population of women reporting a history of violence including domestic violence during pregnancy: a longitudinal cohort study. BMC Pregnancy Childbirth. 2020;20(1):183. Published 2020 Mar 26. doi:10.1186/s12884-020-02864-5

⁴⁹³ Lynnmarie Sardinha, PhD. Global, regional, and national prevalence estimates of physical or sexual, or both, intimate partner violence against women in 2018. The Lancet. February 16, 2022 DOI:https://doi.org/10.1016/S0140-6736(21)02664-7

⁴⁹⁴ Antoniou E, latrakis G. Domestic Violence During Pregnancy in Greece. Int J Environ Res Public Health. 2019 Oct 31;16(21):4222. doi: 10.3390/ijerph16214222 <u>https://pubmed.ncbi.nlm.nih.gov/31683512/</u>

⁴⁹⁵ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y <u>https:// pubmed.ncbi.nlm.nih.gov/31203524/</u>

⁴⁹⁶ Finnbogadóttir H, Baird K, Thies-Lagergren L. Birth outcomes in a Swedish population of women reporting a history of violence including domestic violence during pregnancy: a longitudinal cohort study. BMC Pregnancy Childbirth. 2020;20(1):183. Published 2020 Mar 26. doi:10.1186/s12884-020-02864-5

⁴⁹⁷ Van Parys AS, Deschepper E, Michielsen K, Temmerman M, Verstraelen H. Prevalence and evolution of intimate partner violence before and during pregnancy: a cross-sectional study. BMC Pregnancy Childbirth. 2014 Aug 28;14:294. doi: 10.1186/1471-2393-14-294. <u>https://pubmed.ncbi.nlm.nih.gov/25169813/</u>

⁴⁹⁸ Violence against women prevalence estimates, 2018: global, regional and national prevalence estimates for intimate partner violence against women and global and regional prevalence estimates for non-partner sexual violence against women. Executive summary. WHO. 2021 <u>https://www.who.int/publications/i/item/9789240022256</u>

Almost all studies report a risk of underreporting due in part to the reliance on self-reporting of violence by women, who may not always wish to respond to questions. Furthermore, results of a screening tool for intimate partner violence (IPV) piloted across Belgium, Iceland, Denmark, Estonia, Norway and Sweden indicated cultural differences relating to violence in pregnancy which influences disclosures of experience of violence between countries, as well as health providers' comfort with making inquiries about violence, both of which may impact on figures reported.⁴⁹⁹

Recommendations to Address Violence in Pregnancy

It is crucial for health providers to be aware of, and be trained and able to provide, relevant supports and services to those vulnerable to, or experiencing, violence. Evidence suggests that routine, standardised questions about IPV during antenatal care visits are best timed to identify women who are at risk of - or who are currently - experiencing domestic violence during pregnancy, and to encourage them to seek help.^{500,501} Early identification of current or previous violence during pregnancy is an opportunity to support more positive maternal and child health outcomes. Continuing attention should be paid during the postpartum period as well, particularly to those vulnerable to the risk factors cited above.^{502,503,504,505} However, evidence is unclear as to what uptake of such existing recommendations is across the European Union. Some countries have clinical guidelines for inquiries about violence during pregnancy and during antenatal care. Yet articles from France and Sweden from the period 2019-2020 stated that women were not asked questions on domestic violence during antenatal care visits as part of routine policy. A 2021 WHO report found that only 5% of countries in the WHO European Region had recognized the need for, and specified violence-related services for pregnant women.⁵⁰⁶

The risk factors which are cited above, such as history of violence, etc., should also be taken into consideration to develop or upgrade guidelines for health professionals who come into contact with pregnant women.⁵⁰⁷ Healthcare professionals must be supported to provide quality care via training, provision of standard operating procedures, space to facilitate private and confidential consultation, appropriate referrals and an ability to respond as needed to physical and mental health risks associated with violence during pregnancy.⁵⁰⁸ Many types of healthcare professionals

⁴⁹⁹ Perttu, S. and Kaselitz, V. Addressing Intimate Partner Violence https://www.coe.int/t/pace/campaign/stopviolence/Source/ guidelines_for_health_professionals_maternity_child_health_care_en.pdf

⁵⁰⁰ Perttu, S. and Kaselitz, V. Addressing Intimate Partner Violence https://www.coe.int/t/pace/campaign/stopviolence/Source/ guidelines_for_health_professionals_maternity_child_health_care_en.pdf

⁵⁰¹ Finnbogadóttir, H., Dykes, AK. Increasing prevalence and incidence of domestic violence during the pregnancy and one and a half year postpartum, as well as risk factors: -a longitudinal cohort study in Southern Sweden. BMC Pregnancy Childbirth 16, 327 (2016). <u>https://doi.org/10.1186/s12884-016-1122-6</u>

⁵⁰² Izaguirre, A., & Calvete, E. (2014). Intimate partner violence during pregnancy: Women's narratives about their mothering experiences. Psychosocial Intervention, 23(3), 209-215. <u>https://doi.org/10.1016/j.psi.2014.07.010</u>

⁵⁰³ Institute of Obstetricians and Gynaecologists, Royal College of Physicians of Ireland and Directorate of Quality and Strategy Health Service Executive. (2014) Clinical Practice Guidelines: Antenatal routine enquiry regarding violence in the home.

⁵⁰⁴ Maciel MNA, Blondel B, Saurel-Cubizolles MJ. Physical Violence During Pregnancy in France: Frequency and Impact on the Health of Expectant Mothers and New-Borns. Matern Child Health J. 2019 Aug;23(8):1108-1116. doi: 10.1007/s10995-019-02747-y

⁵⁰⁵ Finnbogadóttir H, Baird K, Thies-Lagergren L. Birth outcomes in a Swedish population of women reporting a history of violence including domestic violence during pregnancy: a longitudinal cohort study. BMC Pregnancy Childbirth. 2020;20(1):183. Published 2020 Mar 26. doi:10.1186/s12884-020-02864-5

⁵⁰⁶ WHO (2021) Addressing violence against women in health and multisectoral policies: a global status report. Geneva: World Health Organization; <u>https://apps.who.int/iris/bitstream/handle/10665/351470/9789240041257-eng.pdf?sequence=1</u>

⁵⁰⁷ Finnbogadóttir, H., Dykes, AK. Increasing prevalence and incidence of domestic violence during the pregnancy and one and a half year postpartum, as well as risk factors: -a longitudinal cohort study in Southern Sweden. BMC Pregnancy Childbirth 16, 327 (2016). <u>https://doi.org/10.1186/s12884-016-1122-6</u>

⁵⁰⁸ Caring for women subjected to violence: a WHO curriculum for training health-care providers. Geneva: World Health Organization; 2019. Licence: CC BY-NC-SA 3.0 IGO. <u>https://apps.who.int/iris/bitstream/handle/10665/330084/9789241517102eng.pdf?sequence=8&isAllowed=y</u>

play an important role in supporting the care of women who are experiencing, or are at risk of experiencing, violence.⁵⁰⁹ Some studies have identified that midwives - with relevant training where needed - could play a key role to support women-centred and community-led approaches to address violence during pregnancy.^{510,511,512}

A number of recommendations for legislation, policy and practice to support the elimination of IPV have been published at the regional European, as well as global level. However, irrespective of the type of recommendation outlined, a common thread which underpins all recommendations is the support of human-rights and women-centred approaches. Furthermore, the WHO Regional Office for Europe's 'Action plan for sexual and reproductive health: towards achieving the 2030 Agenda for Sustainable Development in Europe - leaving no one behind' also includes a number of recommendations to address the cultural and gender norms which perpetuate violence.^{513,514,515,516}

Maternal Health Rights

There have been a number of covenants from the United Nations that promote aspects of human rights, including recommendations for provision of services during pregnancy, delivery and postpartum adapted to migrant women's specific needs. At regional level, the Council of Europe Parliamentary Assembly called on Member States to provide reproductive health care for refugee women and further recognized the vulnerability of pregnant irregular migrants. Maternity Action, an NGO, sets out the different rights and entitlements for undocumented women in Europe.⁵¹⁷ The HEN report has identified specific areas of migrant maternal health that could be targeted by policy-makers,⁵¹⁸ including poor migrant maternal health care (restricted by problems with familiarity, comprehensibility, acceptability, and availability); and affordability.

International human rights instruments underline the right of every person to receive health care as a basic human right, despite their gender or administrative status.⁵¹⁹ Despite their obligations under international human rights law, national laws and practices in many EU Member States differ from these obligations. As a result, a high percentage of undocumented migrant women do

⁵⁰⁹ WHO (2013) Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines. Geneva: WHO <u>https://apps.who.int/iris/bitstream/handle/10665/85240/9789241548595_eng.pdf</u>

⁵¹⁰ Finnbogadóttir H, Baird K, Thies-Lagergren L. Birth outcomes in a Swedish population of women reporting a history of violence including domestic violence during pregnancy: a longitudinal cohort study. BMC Pregnancy Childbirth. 2020;20(1):183. Published 2020 Mar 26. doi:10.1186/s12884-020-02864-5

⁵¹¹ Baird KM, Saito AS, Eustace J, Creedy DK. Effectiveness of training to promote routine enquiry for domestic violence by midwives and nurses: a pre-post evaluation study. Women Birth. 2018;31(4):285–91. <u>https://pubmed.ncbi.nlm.nih.gov/29102526/</u>

⁵¹² Sandall J, Soltani H, Gates S, Shennan A, Devane D. Midwife-led continuity models versus other models of care for childbearing women. Cochrane Database Syst Rev. 2016;4:CD004667. <u>https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.</u> <u>CD004667.pub5/full</u>

⁵¹³ Regional Committee for Europe 66th Session. Copenhagen, Denmark, 12-15 September 2016. Action plan for sexual and reproductive health: towards achieving the 2030 Agenda for Sustainable Development in Europe - leaving no one behind. <u>https://www.euro.who.int/__data/assets/pdf_file/0018/314532/66wd13e_SRHActionPlan_160524.pdf</u>

⁵¹⁴ (WHO (2013) Responding to intimate partner violence and sexual violence against women: WHO clinical and policy guidelines. <u>https://apps.who.int/iris/bitstream/handle/10665/85240/9789241548595_eng.pdf</u>

⁵¹⁵ Policy Department for Citizens' Rights and Constitutional Affairs. 2020. Tackling violence against women and domestic violence in Europe: Added value of the Istanbul Convention and remaining challenges. European parliament. Brussels.

⁵¹⁶ WHO (2021) Addressing violence against women in health and multisectoral policies: a global status report. Geneva: World Health Organization; <u>https://apps.who.int/iris/bitstream/handle/10665/351470/9789240041257-eng.pdf?sequence=1</u>

⁵¹⁷ Maternity Action. EU, EEA, Swiss nationals and family members: maternity rights and benefits <u>https://maternityaction.org.uk/</u> <u>advice/eea-and-familymembers-maternityrightsandbenefits/</u>

⁵¹⁹ Migration for Development <u>http://www.migration4development.org/sites/m4d.emakina-eu.net/files/paper_michelle_levoy.pdf</u>

not access health care services. In accordance with international human rights law and national legislations, fundamental human rights must not be limited or denied to the most vulnerable on the basis of administrative status. The vulnerability and exploitability of undocumented women may be significantly decreased if the normal systems of support, protections and means of redress are guaranteed to them on the same basis as the national population. PICUM's⁵²⁰ focus on health care access, adequate housing standards, fair working conditions and education are linked to the empowerment and emancipation of undocumented women. Their research and the experience of organizations in its network have demonstrated a wide disparity amongst EU Member States concerning legal entitlements of undocumented women to health care services. PICUM identify five different models in which eleven countries may be categorized, briefly describing the care available to undocumented migrants, the implications it has upon women's right to health and finally provide an example of an innovative civil society practice which seeks to overcome these barriers, gaps and failures of state services. These include countries where all care is provided only on a payment basis, such as Austria; other countries offering free health care in very limited cases, such as Hungary and Germany; countries with wider coverage but whose legislation is rather restrictive, ambiguous and with a high degree of uncertainty such as the United Kingdom and Portugal. Other countries, such as France, Belgium and the Netherlands, have put a "parallel" administrative and/or payment system in place concerning health care services for undocumented migrants. However, undocumented women are still treated in the mainstream health system. Finally, Italy and Spain provide the widest health coverage to undocumented migrants. The spirit of the law, particularly in Spain, is to provide universal access to health care.

Regarding the sexual and reproductive health of migrants in the EU, uncertainties on entitlements of diverse migrant groups are fuelled by unclear legal provisions, creating significant barriers to access health systems in general and SRH services in particular. Furthermore, the rare strategies addressing migrants' health fail to address sexual health and are generally limited to perinatal care and HIV screening.⁵²¹

⁵²⁰ Platform for International Cooperation on Undocumented Migrants <u>https://picum.org/</u>

⁵²¹ Ines Keygnaert, Aurore Guieu, Gorik Ooms, Nicole Vettenburg, Marleen Temmerman, Kristien Roelens, (2014) Sexual and reproductive health of migrants: Does the EU care? Health Policy, Volume 114, Issues 2–3, Pages 215-225, ISSN 0168-8510, https://doi.org/10.1016/j.healthpol.2013.10.007

THREE: RESEARCH, DATA AND INVESTMENT

Data must be ethical, robust, representative and understandable if it is to support use by national, European and international stakeholders who make decisions about the health and health care of women and their children.^{522,523} EU-wide initiatives, such as Eurostat, PERISTAT and REPROSTAT were developed in response to the need for sustainable and high-quality data collection, monitoring and evaluation across Member States. Establishing national and regionally comparable health indicators supports improvements in maternal and child health and care for people across the EU through: regular surveillance of, and action upon the quality and effectiveness of reproductive and perinatal health care; and comparison of maternal health data both within and between Member States. The following sections will focus on describing the EU-wide monitoring systems including REPROSTAT and PERISTAT, and where relevant will include some reference to other initiatives, including more nationally representative datasets.

Global, Regional and National Data

Sustainable Development Goal (SDG) 3 is to '*ensure healthy lives and promote well-being for all at all ages*'. A maternal health-specific objective of SDG 3, to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by 2030, illustrates the important role which good maternal health plays across a healthy life course. Progress towards this objective is measured via two indicators: 3.1.1. Maternal mortality ratio and 3.1.2 Proportion of births attended by a skilled birth attendant.⁵²⁴

Between the OECD and Eurostat databases, 388 indicators in total are used to collect information on maternal care. The large majority of these indicators (297/388) were identified as collecting information on the process, and outcomes of maternity care, and only a minority of indicators assessed structural components related to maternal care such as infrastructure and equipment.⁵²⁵ Maternal morbidity was the most commonly occurring indicator *"regarding undesirable outcomes"* across the databases. Intrapartum care was the phase of maternal care most assessed, with less attention paid to indicators used to evaluate postnatal and neonatal care.

In 1999, PERISTAT was established as part of the EU Health Monitoring Programme, with the aim of producing a high quality perinatal health information system capable of informing evidencebased decision-making for the health and care of pregnant women and new-borns, using valid and reliable indicators.⁵²⁶ An initial feasibility study for the availability of perinatal health indicators identified a number of different routine data collection systems within project countries including: civil registration systems, population-based clinical registers, hospital- and profession-based data collection systems including discharge registers, condition-specific surveys and routine, confidential enquiries into adverse events and surveys.⁵²⁷ Whereas civil registration of births and

⁵²² Temmerman M, Foster LB, Hannaford P, Cattaneo A, Olsen J, Bloemenkamp KW, Jahn A, da Silva MO. Reproductive health indicators in the European Union: The REPROSTAT project. Eur J Obstet Gynecol Reprod Biol. 2006 May 1;126(1):3-10. doi: 10.1016/j.ejogrb.2005.11.047. <u>https://pubmed.ncbi.nlm.nih.gov/16500743/</u>

⁵²³ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

⁵²⁴ SDG Indicators Metadata Repository https://unstats.un.org/sdgs/metadata/

⁵²⁵ European Parliament's Committee on Women's Rights and Gender Equality (2019) Access to maternal health and midwifery for vulnerable groups. EU. 2019 <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874</u> <u>EN.pdf</u>

⁵²⁶ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

⁵²⁷ Macfarlane et al, 2003. The availability of perinatal health indicators in Europe. Obstetrics and Gynaecology <u>https://www.europeristat.com/images/doc/EPHR/availability.pdf</u>

deaths are required by law and provide information related to perinatal health for citizens and permanent residents of Member State countries,⁵²⁸ most of the other above-mentioned data collection systems were developed for specific clinical purposes at either a national, regional or local level, and record more information than civil registration systems. Many of these data collection systems are based on information from midwives, doctors or other clinical informants; and in some cases, from parents.

The Euro-PERISTAT project compiles population-based data at a national level from some routine sources (such as civil registration systems, discharge registers, etc.) named above. Whilst the PERISTAT feasibility study indicated evidence of under-reporting of stillbirths and neonatal deaths in civil registration systems (the Netherlands and Greece), overall these records are the most complete at the population-level with regards to data collection of major events of birth and death. Some civil registration systems record background characteristics such as mother's age, parity, and plurality, or babies' birth weights. However most countries record data on a limited number of variables related to perinatal health, with most lacking clinical information regarding births and factors leading to death or regarding the maternal care which was given.⁵²⁹ Births to women who are non-residents are registered in most countries,⁵³⁰ although migrants, refugees and asylum seekers are at risk of under-reporting of their maternal and child health data, which is of serious concern given they are at high risk of adverse events compared with national residents.⁵³¹ A 2003 study found slight variability in the indicator criteria used for birthweight and gestational age across civil registration systems, which impacts on comparison of measures of stillbirths and live births amongst the participating countries of the PERISTAT project.⁵³²

Based on the review of routine sources used across the EU, PERISTAT indicators were carefully developed by a cross-EU Member State working group to minimise duplication of effort and variation in definitions and findings across national data collection systems. Its current indicator list includes ten core indicators, as well as a further 20 recommended indicators which collect information on: foetal, neonatal, and child health; maternal health; population characteristics and risk factors; and health services.

The PERISTAT project was also developed in a manner which complements existing European initiatives such as EUROCAT (European Concerted Action on Congenital Anomalies and Twins).⁵³³ The REPROSTAT project was developed for the purposes of: identifying needs for improving sexual and reproductive health across the EU; supporting regular monitoring and evaluation of quality, effectiveness, and improvement made in reproductive health programmes within Europe; and facilitating comparison of reproductive health data both within and between EU Member States.⁵³⁴ As of 2003, following consultation with 200 reproductive health experts across Europe and feasibility testing in Italy and Germany, a core set of 13 reproductive health indicators were identified. The reproductive health indicators cover a number of related aspects sexual and reproductive health behaviour, including fertility, contraceptive use, use of assisted reproductive

⁵²⁸ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

⁵²⁹ Macfarlane et al, 2003. The availability of perinatal health indicators in Europe. Obstetrics and Gynaecology <u>https://www.europeristat.com/images/doc/EPHR/availability.pdf</u>

⁵³⁰ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

⁵³¹ Access to maternal health and midwifery for vulnerable groups. EU. 2019 <u>https://www.europarl.europa.eu/RegData/etudes/</u> <u>STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁵³² Macfarlane et al, 2003. The availability of perinatal health indicators in Europe. Obstetrics and Gynaecology <u>https://www.europeristat.com/images/doc/EPHR/availability.pdf</u>

⁵³³ Macfarlane et al, 2003. The availability of perinatal health indicators in Europe. Obstetrics and Gynaecology <u>https://www.europeristat.com/images/doc/EPHR/availability.pdf</u>

technology, sexually transmitted infections and age at first intercourse. To support feasibility of collection and use, although some indicators are based on information to be drawn from specific health surveys, many of the REPROSTAT indicators are based upon routine datasets which were already established in many EU countries.

Feasibility of Monitoring

EURO-PERISTAT has been thoroughly examined since its establishment: in 2003, Wildman et al. described variation across Europe in PERISTAT indicators of health in the perinatal period, and assessed the comparability of these indicators across 15 European countries.⁵³⁵ Comparative analysis included descriptions of births following management of subfertility, timing of first antenatal visit, onset of labour, mode of delivery, place of birth, preterm births in units without NICU, and breast-feeding uptake. **The authors found broad variation in the ability to provide data on perinatal indicators, and in perinatal health care across the European Union**. There is an overall challenge in identifying indicators that are meaningful and robust for the full distribution of health care systems represented in the European Union. **Further work is needed to ensure that the implementation of each indicator is comparable across Member States.**

An analysis of aggregate data using indicators of maternal mortality and severe acute morbidity from routine statistical systems from 2003-4 across 25 EU countries and Norway was compiled by the EURO-PERISTAT project to assess capacity to develop routine monitoring of maternal health in the European Union.⁵³⁶ Analysis of available data, as well as gaps in data not provided from countries indicated that the available data on maternal mortality and morbidity were insufficient for monitoring trends over time in Europe and for comparison between countries. Furthermore, when data was compared for validity with data from national confidential enquiries, countries with specific audit systems reported higher maternal mortality ratio than those without audits. The authors of this study subsequently recommended confidential enquiries into maternal deaths in Europe.

An analysis of data reported in the 2018 Euro-PERISTAT report identified wide variability in the extent to which countries were able to provide the relevant data required for the project. Most of the necessary data required was provided from Nordic countries, Ireland, Austria and Luxembourg; whereas Spain, Portugal, Greece and Italy produced the least amount of data versus indicators required.⁵³⁷ Civil registration and medical birth register data are the most comprehensive population-level datasets with close to 100% coverage, even for the minority of EU countries where registers are voluntary. As of 2015, the majority of PERISTAT core indicators are collected from medical birth registers which contain more specific information (in comparison to civil registration) on maternal characteristics, and about diagnoses, care and interventions during the perinatal period for mothers and children.⁵³⁸

⁵³⁴ Temmerman M, Foster LB, Hannaford P, Cattaneo A, Olsen J, Bloemenkamp KW, Jahn A, da Silva MO. Reproductive health indicators in the European Union: The REPROSTAT project. Eur J Obstet Gynecol Reprod Biol. 2006 May 1;126(1):3-10. doi: 10.1016/j.ejogrb.2005.11.047 <u>https://pubmed.ncbi.nlm.nih.gov/16500743/</u>

⁵³⁵ Wildman K, Blondel B, Nijhuis J, Defoort P, Bakoula C. European indicators of health care during pregnancy, delivery and the postpartum period. Eur J Obstet Gynecol Reprod Biol. 2003 Nov 28;111 Suppl 1:S53-65. doi: 10.1016/j.ejogrb.2003.09.006. PMID: 14642320.

⁵³⁶ Bouvier-Colle, M.-H., Mohangoo, A., Gissler, M., Novak-Antolic, Z., Vutuc, C., Szamotulska, K., Zeitlin, J. and (2012), What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe. BJOG: An International Journal of Obstetrics & Gynaecology, 119: 880-890. https://doi.org/10.1111/j.1471-0528.2012.03330.x

⁵³⁷ Euro-PERISTAT Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

⁵³⁸ Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. November 2018. Available www.europeristat.com <u>https://www.europeristat.com/images/EPHR2015_web_hyperlinked_Euro-Peristat.pdf</u>

However there are gaps in country-specific data for certain indicators of maternal health and care (for example fewer than 50% of EU Member States have nationally representative data on obesity)⁵³⁹ and on cross-cutting themes such as data on vulnerable populations, user experience of care, and on normal childbirth versus adverse events,^{540,541} which are under-researched and reported on in the EU.^{542,543} These gaps impede the ability to assess the state of maternal and child health and care across the EU, as well as to make comparisons between Member States.

During pregnancy and breastfeeding, there tend to be multiple interactions between women and their healthcare professionals, and a vast amount of data is routinely recorded in clinical practice. Although this represents a unique opportunity to collect relevant data, there is a shared view that these data are not being used efficiently and optimally. A sustainable model and infrastructure are needed so that these data can be systematically identified, recorded, collected, processed, analysed and translated into evidence that can support informed decision-making and effective communication with the public, healthcare workers and key stakeholders.⁵⁴⁴

Investment

Information for Action (InfAct) was launched in March 2018 in 28 EU countries for a period of 36 months with the goal to strengthen national and EU health information systems,⁵⁴⁵ through working in three areas: (1) Establishing a sustainable research infrastructure which will support population health and health system performance assessment; (2) Strengthening European health information and knowledge bases and health information research capacities to reduce health information inequalities; (3) Supporting health information interoperability and innovative health information tools and data sources. The Euro-PERISTAT network also collaborates with InfAct on a number of different work packages: supporting conceptualisation of a sustainable information system, sharing of knowledge and support with analysis and integration towards development of new indicators of maternal and child health.⁵⁴⁶

To give a longitudinal perspective, a retrospective study aimed to determine the association between reductions in government healthcare spending on maternal mortality and maternal mortality rates in 24 countries in the EU over a 30-year period, 1981–2010.⁵⁴⁷ Using multivariate regression analysis, the study controlled for country-specific differences in healthcare, infrastructure, population size and demographic structure, and government healthcare spending was measured as a percentage of gross domestic product. Reductions in government healthcare spending were significantly associated with increased maternal mortality rates, which may occur for example through changes in the provision of skilled health professionals attending births.

⁵⁴⁶ Euro Peristat <u>https://www.europeristat.com/index.php/our-network/infact.html</u>

⁵³⁹ Pineda E, Sanchez-Romero L, M, Brown M, Jaccard A, Jewell JGalea G, Webber L, Breda: Forecasting Future Trends in Obesity across Europe: The Value of Improving Surveillance. Obes Facts 2018;11:360-371. doi: 10.1159/000492115 <u>https://www.karger.com/Article/Fulltext/492115</u>

⁵⁴⁰ Mabel, J., Morrow, E., Ball, J., Rober, G. and Griffiths, P. (2012) High quality care metrics for nursing. London: National Nursing Research Unit, Kings College London

⁵⁴¹ Hanafin, S. and Dwan O'Reilly, E. National and International review of literature on models of care across selected jurisdictions to inform the development of a National Strategy for Maternity Services in Ireland <u>https://assets.gov. ie/18837/126438a9b5f84f138b8e2dd1fc5c784f.pdf</u>

⁵⁴² Euro Peristat, & Macfarlane, A. J. (2018). Euro-Peristat Project. European Perinatal Health Report. Core indicators of the health and care of pregnant women and babies in Europe in 2015. Euro-Peristat. <u>https://openaccess.city.ac.uk/id/eprint/21162/</u>

⁵⁴³ Temmerman M, Foster LB, Hannaford P, Cattaneo A, Olsen J, Bloemenkamp KW, Jahn A, da Silva MO. Reproductive health indicators in the European Union: The REPROSTAT project. Eur J Obstet Gynecol Reprod Biol. 2006 May 1;126(1):3-10. doi: 10.1016/j.ejogrb.2005.11.047 <u>https://pubmed.ncbi.nlm.nih.gov/16500743/</u>

⁵⁴⁴ European Medicines Agency (2020) Report Workshop on benefit-risk of medicines used during pregnancy and breastfeeding https://www.ema.europa.eu/en/documents/report/report-workshop-benefit-risk-medicines-used-during-pregnancybreastfeeding_en.pdf

Joint Action on Health Information https://www.inf-act.eu/about-us

⁵⁴⁷ Maruthappu, M, Ng, KYB, Williams, C, Atun, R, Agrawal, P, Zeltner, T. The association between government healthcare spending and maternal mortality in the European Union, 1981-2010: a retrospective study. BJOG 2015; 122: 1216- 1224. <u>https://obgyn.onlinelibrary.wiley.com/doi/full/10.1111/1471-0528.13205</u>

FOUR: POLICY IN EUROPE

International policy commitments, such as the Sustainable Development Goals (SDGs), set out broad targets for reducing health inequalities globally. The SDGs set out specific targets which call upon states to ensure universal access to sexual, reproductive, and maternal health care, to improve maternal health and to reduce maternal mortality for all women. For example, Target 3.1 aims to decrease the global maternal mortality rate to less than 70 per 100 000 live births by 2030. In 2010, the WHO stated that reproductive health included *"the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant."*

There are several policy frameworks which could be utilised to realise improved maternal health care. Every Woman, Every Child (EWEC) was launched in 2010 to catalyse actions needed to implement the UN's Global Strategy for Women's, Children's and Adolescent's Health to address the health challenges which face women, children and adolescents. In this area of work, UNAIDS, UNFPA, UNICEF, UN Women, World Bank and the WHO have focused on leveraging their respective strengths and capacities via technical support to support high-burden countries to improve the survival, health, and well-being of women, newborns, children, and adolescents.⁵⁴⁸

Furthermore, at the 2016 World Health Assembly (WHA) a resolution was passed (WHA69.2) committing to implementation of the Global Strategy for Women's, Children's and Adolescent's Health (2016-2030), the objective of which is for the lives of every woman, child and adolescent worldwide to survive, thrive and transform.⁵⁴⁹ In 2020, it was noted that the Global Action Plan for Health Lives and Well-being for All (SDG GAP) should be more strongly aligned with the EWEC movement and vision, primarily with regard to its work at the *"country-level on sexual, reproductive, maternal, newborn, child and adolescent health with a focus on equity and the most disadvantaged"*.⁵⁵⁰ This was reiterated by delegates at the 2021 WHA who noted that the second annual SDG GAP should play a key role in achieving the targets outlined in the Global Strategy,^{551,552} whilst the EWEC remains primarily responsible for reporting, advocacy and accountability.^{553,554}

Further relevant WHA resolutions of note include:

- WHA67.10 (2014) newborn health action plan
- ▲ WHA63.16 (2010) on birth defects
- WHA58.31 (2005) on working towards universal coverage of maternal, newborn and child health interventions
- WHA45.45 (1992) on women, health and development
- WHA45.22 (1992) on child health and development: health of the newborn

⁵⁴⁸ WHO. Stronger collaboration for an equitable and resilient recovery towards the health-related Sustainable Development Goals <u>https://www.who.int/publications/i/item/9789240026209</u>

⁵⁴⁹ WHO Committing to implementation of the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_14-en.pdf

⁵⁵⁰ WHO. Stronger collaboration for an equitable and resilient recovery towards the health-related Sustainable Development Goals <u>https://www.who.int/publications/i/item/9789240026209</u>

⁵⁵¹ WHO Update from the Seventy-fourth World Health Assembly - 28 May 2021 <u>https://www.who.int/news/item/28-05-2021-update-from-the-seventy-fourth-world-health-assembly-28-may-2021</u>

⁵⁵² WHO. Stronger collaboration for an equitable and resilient recovery towards the health-related Sustainable Development Goals https://www.who.int/publications/i/item/9789240026209

⁵⁵³ WHO. Stronger collaboration for an equitable and resilient recovery towards the health-related Sustainable Development Goals <u>https://www.who.int/publications/i/item/9789240026209</u>

⁵⁵⁴ WHO Committing to implementation of the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) <u>https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_14-en.pdf</u>

The International Year of the Nurse and the Midwife, celebrated worldwide in 2020, highlighted the key role of midwifery and neonatal health providers in ensuring high-quality health services for women and their children.⁵⁵⁵ At the European level, the priorities of the European Presidency held by Slovenia from July 1st to December 31st 2021 did not include an explicit emphasis on strengthening health, women's health nor maternal health.⁵⁵⁶ However, the Trio of Presidencies for the same time period did state they would contribute to improving areas of health, such as healthcare literacy,⁵⁵⁷ which as stated earlier in the report is a vital area to support maternal health and care improvements.

Articles 160 and 168 of the Treaty on the Functioning of the EU outline the precedent at the EU level to commit to improving maternal and child health and care as a means to improving health overall.⁵⁵⁸ Whilst some policy areas outlined below are recommended by the EIWH, multiple policy areas that lie outside the healthcare system must also be considered such as socioeconomic, political, educational, transport, environmental, cultural and ethnicity, as well as understanding the potential for improvements in these areas to impact upon access to maternal health and care, and addressing health outcomes from a life course approach. The most recent EU4Health Programme (2021-2027) – *"the fourth and largest of the EU Health Programmes since their inception in 2003, with a budget of 5.3 million"* – includes an emphasis on thematic areas of relevance to this report including: health promotion and disease prevention; making medicines available and affordable, and access to care for vulnerable groups.⁵⁵⁹ Nevertheless, an explicit focus on maternal health, pregnancy or breastfeeding is absent from the text of the proposal, let alone any emphasis on women's health more broadly.⁵⁶⁰

EU4Health, 2021 – 2027, is a vision for a healthier Europe, in practice it is a response to Covid-19 and focuses on health systems' resilience. The areas of action are to improve and foster health in the EU; to protect people in the EU from serious cross-border threats to health; to improve medical products, devices, and crisis-relevant products, to strengthen health systems.⁵⁶¹ Urgent Health Priorities for the EU are the response to the COVID-19 crisis and reinforcing the EU's resilience for cross-border health threats; Europe's Beating Cancer Plan; and the Pharmaceutical Strategy for Europe. EU4Health membership comprises EU Member States; stakeholders including representatives of civil society, patients associations, academics and organisations of healthcare professionals; the European Parliament and the European Commission; and the Health and Digital Executive Agency. EU4Health recognises synergies with other funds, acknowledging that health challenges are cross-cutting by nature. EU4Health works together with other Union programmes, policies, instruments and actions:

- Luropean Social Fund Plus (ESF+) to support vulnerable groups in accessing healthcare
- European Regional and Development Fund to improve regional health infrastructure
- A Horizon Europe for health research
- Union Civil Protection Mechanism/rescEU to create stockpiles for emergency medical supplies

⁵⁵⁵ WHA report on implementation of the Global Strategy (2016-2030) <u>https://pmnch.who.int/resources/publications/m/item/</u> wha-report-on-implementation-of-the-global-strategy-(2016-2030)

The presidency of the Council of the EU <u>https://www.consilium.europa.eu/en/council-eu/presidency-council-eu/</u>

⁵⁵⁷ <u>https://data.consilium.europa.eu/doc/document/ST-8086-2020-REV-1/en/pdf</u>

⁵⁵⁸ EU Manifesto for Women's Health 2018 <u>https://eurohealth.ie/manifesto2018/</u>

 ⁵⁵⁹ European Health and Digital Executive Agency (HaDEA) <u>https://hadea.ec.europa.eu/programmes/4th-eu-health-programme_en</u>
⁵⁶⁰ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of a Programme for the Union's action in the field of health -for the period 2021-2027 and repealing Regulation (EU) No 282/2014 ("EU4Health Programme") <u>https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020PC0405</u>

⁵⁶¹ EU4Health 2021-2027 - a vision for a healthier European Union https://ec.europa.eu/health/funding/eu4health_en

- Digital Europe and Connecting Europe Facility for creating the digital infrastructure needed for digital health
- ▲ Invest EU Programme
- 🔺 Single Market Programme
- Recovery and Resilience Facility
- 🔺 Erasmus
- Emergency Support Instrument

The EU has an obligation to safeguard human health according to Article 168 of the Treaty on the Functioning of the European Union (TFEU) and Article 35 of its Charter of Fundamental Rights in 2000.⁵⁶² The first and second Health Programmes, include those involving 'vulnerable groups', and in the third Health Programme (2014-2020), 'reducing health inequalities' is a general, rather than specific, objective, and several projects have focused on migrants. The EU has also subscribed to the UN Sustainable Development Goals, specifically Goal 3.8, which aims at 'achieving universal health coverage, including risk protection, access to quality essential health care services and access to safe, effective, quality and affordable essential medicines and vaccines for all'. The European Commission issued the Communication Social Investment Package recognising the role of the health care system in enabling the inclusive growth objectives in the Europe 2020 Strategy. The EU migration policy includes the 'Common European Asylum System', various migration programmes and agreements and partnerships with neighbouring countries. The Commission has used relevant directives to enforce standards of health care entitlements for EU migrants (Directive on Cross-border Healthcare), refugees (Qualification Directive) and asylum seekers (Reception Conditions Directive). Other important frameworks include the WHO Making Pregnancy Safer Framework and the WHO recommendations on antenatal care for a positive pregnancy experience.

Turning to EU policy on parental leave,⁵⁶³ "regular monitoring of parental leave policies by the International Network on Leave Policies and Research⁵⁶⁴ shows that leave policies in the EU are in constant flux. Member States are working on leave-policy designs that not only support better gender balance in the use of parental leave and the work—life balance of all working parents, but also enhance fertility rates and child well-being." Although all Member States fulfil the minimum 4-month requirement set out in the parental leave directive (Directive 2010/18/EU), the overall duration of available leave differs considerably across the EU. There are Member States where the parental leave barely exceeds the 4-month requirement such as the United Kingdom with 4.2 months and Poland with 7.4 months. Other Member States provide leave until the child is 3 years old (e.g. CZ, EE, ES, FR, LT, HU) (Blum et al., 2018)." In Croatia and Latvia - as it is in Poland - same-sex couples are not eligible for parental leave. In Estonia, parents cannot take parental leave at the same time as the other parent. Finland requires non-EU nationals and migrant parents to be living in the country for 180 days prior to the birth of the baby to be eligible for parental leave (not simulated in the eligibility analysis)."

The European Directive on minimum standards for reception of asylum seekers (2013/33/EU) requests that EU Member States ensure "access to appropriate medical and psychological

⁵⁶² European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs (2019) Access to maternal health and midwifery for vulnerable groups in the EU <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁵⁶³ European Institute for Gender Equality. Work Life Balance <u>https://eige.europa.eu/gender-mainstreaming/resources/italy/work-life-balance</u>

⁵⁶⁴ International Network on Leave Policies & Research <u>https://www.leavenetwork.org/introducing-the-network</u>

treatment or care for vulnerable groups", with pregnant asylum-seeking women identified among those, and to take "*appropriate measures that prevent gender-based violence including sexual assault and harassment*" within reception centres and accommodation facilities. The "*minimum initial service package for reproductive health in crisis situations*" produced by the UNHCR provides guidelines on priority activities designed to prevent and manage the consequences of sexual violence, reduce HIV transmission, prevent excess maternal and newborn morbidity and mortality, and plan for comprehensive reproductive health services. One European project (SH-CAPAC) is designed to support countries under pressure from large migration influx in ensuring effective health care for migrants, including maternal health care.⁵⁶⁵

The report on access of vulnerable groups to health and midwifery calls for policies to rise to the new challenges of diversity and counteract the deepening of all types of inequalities. Embracing difference and inclusion, rather than marginalisation and exclusion, will lead to a better use of services, gender- and difference-sensitive policies, with a healthier and happier future for all those who inhabit the EU territory.⁵⁶⁶

Gender Equality (including Violence during Pregnancy)

The European Institute for Gender Equality (EIGE) has a number of strategic policy priorities in this area of health, in recognition of, and to address, significant health inequalities between men and women in the EU.⁵⁶⁷ In order to improve access to maternal health and midwifery for vulnerable groups in the EU (201) it is necessary to:

- "increase women's access, throughout their lifecycle, to appropriate, affordable and quality healthcare, information and related services"⁵⁶⁸
- "strengthen preventive programmes that promote women's health"⁵⁶⁸
- "undertake gender-sensitive initiatives that address sexually transmitted diseases, HIV/AIDS, and sexual and reproductive health issues"⁵⁶⁸
- "promote research and disseminate information on women's health"⁵⁶⁸
- "increase resources and monitor follow-up for women's health"⁵⁶⁸

The Istanbul Convention of the Council of Europe on preventing and combating violence against women and domestic violence entered into force in 2014. As of 2018 all 28 Member States have signed it, and 16 have ratified it.⁵⁶⁹ EU gender equality law has been implemented in the domestic laws of the 28 Member States of the European Union, as well as Iceland, Liechtenstein and Norway (the EEA countries) and four candidate countries (the Former Yugoslav Republic of Macedonia, Montenegro, Serbia and Turkey).⁵⁷⁰ The analysis is based on the country reports

⁵⁶⁵ Keygnaert I, Ivanova O, Guieu A, Van Parys A-S, Leye E, Roelens K. What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. Copenhagen: WHO Regional Office for Europe; 2016 (Health Evidence Network (HEN) synthesis report 45). <u>https://www.euro.who.int/______data/assets/pdf_______117109/HEN-synthesis-report-45.pdf</u>

⁵⁶⁶ European Parliament's Policy Department for Citizens' Rights and Constitutional Affairs (2019) Access to maternal health and midwifery for vulnerable groups in the EU <u>https://www.europarl.europa.eu/RegData/etudes/STUD/2019/608874/IPOL_STU(2019)608874_EN.pdf</u>

⁵⁶⁷ European Institute for Gender Equality. Health <u>https://eige.europa.eu/gender-mainstreaming/policy-areas/health</u>.

⁵⁶⁸ UN Women (1995). The United Nations Fourth World Conference on Women. Beijing, China. <u>https://www.un.org/womenwatch/</u> <u>daw/beijing/platform/health.htm</u>

⁵⁶⁹ World Health Organization (2016) What is the evidence on the reduction of inequalities in accessibility and quality of maternal health care delivery for migrants? A review of the existing evidence in the WHO European Region. <u>https://www.euro.who.int/en/ publications/abstracts/what-is-the-evidence-on-the-reduction-of-inequalities-in-accessibility-and-quality-of-maternal-healthcare-delivery-for-migrants-a-review-of-the-existing-evidence-in-the-who-european-region-2017</u>

⁵⁷⁰ Publication Office of the European Union (2018) Gender Equality Law in Europe <u>https://op.europa.eu/en/publication-detail/-/publication/9b101483-3a44-11e9-8d04-01aa75ed71a1</u>

written by the gender equality law experts of the European equality law network (EELN). A comparative analysis offers a more recent review of non-discrimination law in 2020 and gender equality law in 2019.^{571,572}

Research and Information Systems

The EIWH Manifesto calls on the European Union to translate biological differences and social influences into regulatory and healthcare practice, requiring research data to be disaggregated by sex, age and social status and invest in a life-course approach to health promotion tackling inequalities in line with Articles 160/168 -Treaty on the Functioning of the European Union, the UN Sustainable Development Goals (SDGs) and the European Pillar of Social Rights.⁵⁷³ The Clinical Trials Regulation (536/2014) must be implemented in order to combat the systematic under representation of women in clinical trials, to improve the reporting of sex and gender in research findings, as well as to support translation of the knowledge from sex and gender research into regulatory and healthcare practice. Sustainable Development Goal 5b commits all UN Member States to ensuring women's access to all benefits of scientific development and technologies that avert death, disability, and reductions in quality of life, including development of therapeutic agents for the current Covid-19 pandemic.⁵⁷⁴ EU4Health, established by Regulation (EU) 2021/522, will provide funding to eligible entities, health organisations and NGOs from EU countries, or non-EU countries associated with the programme.⁵⁷⁵

Finance and Implementation

An estimated 0.6% of EU funding appropriations were allocated to gender equality measures between 2014 and 2020, and information on the use of funds for gender equality in Member States is available.⁵⁷⁶

EIT Health EU, has proposed an implementation matrix for implementing values based care in Europe, which they describe as "a shared language for describing, visualising and implementing a value-based programme.⁵⁷⁷ The challenge is to make each concept concrete and relevant, while not oversimplifying complexities. Each of the five dimensions of the Matrix is made up of building blocks, with related dimensions, in which the five dimensions are colour coded. This Matrix can be applied across most health care organisations and systems." The building blocks include investments, incentives, internal forces, and external collaborations, among others, visible diagrammatically in the report.⁵⁷⁸

⁵⁷¹ European Equality Law Network (2021) A comparative analysis of gender equality law in Europe. <u>https://www.equalitylaw.eu/</u> <u>publications/comparative-analyses</u>

⁵⁷² European Equality Law Network. <u>www.equalitylaw.eu</u>

⁵⁷³ European Public Health Alliance (2019) Healthy Women - Healthy Europe https://epha.org/healthy-women-healthy-europe/

⁵⁷⁴ United Nations Department of Economic and Social Affairs. Achieve gender equality and empower all women and girls https://sdgs.un.org/goals/goal5

⁵⁷⁵ European Commission. Public Health. EU4Health 2021-2027 – a vision for a healthier European Union <u>https://ec.europa.eu/health/funding/eu4health_en</u>

⁵⁷⁶ Director General for Internal Policies (2016) The use of funds for gender equality in selected Member States <u>http://www.europarl.</u> <u>europa.eu/RegData/etudes/STUD/2016/571393/IPOL_STU(2016)571393_EN.pdf</u>

⁵⁷⁷ EIT Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz), 2020. <u>https://eithealth.eu/wp-content/uploads/2020/06/Implementing-Value-Based-Healthcare-In-Europe.pdf</u>

⁵⁷⁸ EIT Health, Implementing Value-Based Health Care in Europe: Handbook for Pioneers (Director: Gregory Katz), 2020. <u>https://eithealth.eu/wp-content/uploads/2020/06/Implementing-Value-Based-Healthcare-In-Europe.pdf</u>

CONCLUSION

This report has reviewed the state of evidence on maternal health in the European Union. Through a desk review of the literature, the report examined broad trends across the EU, highlighting salient issues on topics related to maternal health, in terms of the health care journey and the maternal care context. The report presented an opportunity to analyse the extent to which women are receiving high quality, woman centred, maternal care that prioritises their health and well-being. As part of the maternal health care journey, evidence was reviewed in relation to public health, health promotion and disease prevention; access to care and information; labour and delivery; health condition management; and safe use of medication. As part of the maternal health care context, evidence was reviewed in relation to socio-economic support around the time of birth; disparities for vulnerable populations; research, data and investment, and policy in Europe.

This report was not a systematic review and thus the material included within it does not represent an exhaustive account of the evidence base. Nor does it seek to rank or compare EU Member States along any set criteria. Rather, the document reviews the readily available data at EU level, as well as scientific research conducted and published across the EU, to present a picture of the sorts of disparities that women experience in relation to their maternal health. The aim is thus to inform understanding at European level on the nature of disparity within the European Union.

The report maintained an open approach to disparity, discussing trends across the geography of the EU, both between and within Member States, as well as among the EU population in terms of socio-economic and demographic features, among others. While EU maternal health outcomes and experiences are favourable in global comparative terms, the findings of this review highlighted several challenges that remain in meeting the maternal health needs of women across the EU.

The time of pregnancy represents a point in time to stress test a woman's health and to establish greater connection to the health system. Women's journeys are diverse in terms of their health situations and their ability to access quality care. Key trends regarding health promotion and disease prevention for women were reviewed, including recommendations for supporting women to optimise their health before, during, and after pregnancy. Both screening and behaviour change mechanisms can promote good health for women during pregnancy. An important aspect of promotion is being able to access information and care. Access to health comprises approachability, acceptability, availability, affordability and appropriateness, and disparities can manifest in relation to geography, socio-economic and demographic characteristics, legal features within national jurisdictions, and health literacy among the population. In addition to documented disparities in access, poor or substandard care is associated with up to half of maternal deaths in the EU. Sick women get pregnant, and pregnant women get sick. Care is required around the management of diabetes, hypertensive disorders, cardiovascular disease, urinary incontinence, iron, strep-b, asthma and mental health, among others. However, the evidence base on the use of medication for women around the time of pregnancy and childbirth is not strong. There is a need for more evidence about safe and effective use of medications, especially where more women are postponing pregnancy until later in life, for pregnant women with chronic conditions, or who become sick during pregnancy. No data on women during pregnancy is being generated through clinical trials.

The broader socio-economic context of maternal health frames these experiences for women. Support around the time of birth depends upon the legal and socio-economic characteristics prevailing in the jurisdiction in which women reside. Apart from pregnancy and birth itself,
women's access to the labour market and to social security including childcare is affected. Among the population of women, vulnerable populations require particular attention in realising the right to access health. Women who experience poverty, who hold a migrant or refugee status, and who experience intimate partner violence, amongst other vulnerabilities, experience particular inequalities and risks. There is a need for increased research, data collection and investment to support national, European and international stakeholders who make decisions about the health and health care of women and their children. Evidence can also support progress towards various policy frameworks such as the Sustainable Development Goals. As an example, the WHO has conceptualised a framework for the provision of high quality care as well as the experience of care around the time of childbirth for women, related to the broader health system's functions. This is especially the case in relation to vulnerable groups, as well as questions about how to strengthen the agenda to focus on well-being in pregnancy, and not just survival.

At national level, strategies such as Ireland's National Maternity Strategy can seek to support women to make choices for themselves, to avail of the right care at the right time and in the right place. The model of care in Ireland's strategy is care that is supported, assisted and specialised and an expansion of midwifery and community based care, important for vulnerable women, women living in rural areas, and marginalised women. There is also a process of de-medicalising maternity care, while also recognising that a wide variety of health issues can be captured within the maternity setting. Ireland's strategy places maternal care on the national agenda, to be followed by the publication of a women's health action plan.

Further areas of research that could inform maternal care across the EU include comparisons of obstetric and midwifery education, roles and responsibilities, which can take into account differences in practice within as well as between countries. This allows for comparison on "formulation of and adherence to clinical guidelines, exploring the impact of differences in healthcare systems and their financing, and parents' and professionals' attitudes to care at delivery,"⁵⁷⁹ and would expand the range of data collected at country-level to be shared and assessed for comparisons at EU level.

There has been political attention regarding maternal health at EU level, for example through the European Parliament's Committee on Women's Rights and Gender Equality. This report adds to the body of work already established, contributing to the evidence base on the situation for women in Europe regarding their maternal health. While countries in the European region experience favourable trends in a global context, the evidence in this report documents remaining work towards realising a right to health care in practice for all women across the European Union. There is an opportunity to frame access to maternal health and women's autonomy under the umbrella of health as a human right. It is timely to foreground and prioritise maternal care within policy statements and actions related to gender equity, with work undertaken to foreground women as equal citizens in the European Union. Including maternal health within policy statements on gender equity will accord maternal health the priority and platform necessary to begin to realise rights to maternal care for all women, in the diversity of their circumstances, within the EU. Statements at EU level must be supported through dialogue with Member States on their specific policy contexts, including the actors and agencies within those contexts.

⁵⁷⁹ Macfarlane AJ, Blondel B, Mohangoo AD, et al. Wide differences in mode of delivery within Europe: risk-stratified analyses of aggregated routine data from the Euro-Peristat study. BJOG. 2016;123(4):559-68. doi: 10.1111/1471-0528.13284. <u>https://pubmed.ncbi.nlm.nih.gov/25753683/</u>

Steps for Action

A total of 25 recommendations are presented across 5 key actions to protect, promote, and advance maternal and infant health across Europe to develop and support effective, equitable and efficient policies and tools to support quality maternal care and safe pregnancies for all.

Enact and Enforce

Action 1: Utilise & Strengthen Existing European Union Legislation & Policy Tools to protect and improve maternal & infant health and wellbeing					
Recommendations					
1	2	3	4	5	
Support the Clinical Trials Regulation (536/2014)	Enact & Monitor Work Life Balance Directive for Parents & Carers (2019)	Revise, Monitor & Enforce the EU Maternity Leave Directive (92/85/EEC)	Gender Equity Measures	Gender Equality Litigation	
		How?			
Address underrepresentation of women in clinical trials, particularly during pregnancy & lactation. Collect vital data on medicine use during pregnancy & lactation.	Enact the 2019 Council Recommendation on high-quality early childhood education & care systems & the 2022 EU Care Strategy.	Ensure that the existing EU Maternity Leave Directive is monitored and enforced, after 2008 efforts to update it were abandoned in 2015.	Extend the EU Gender Equality Strategy (2020 - 2030), and the developed transformative concept of gender equity, to maternal health & provision of health care.	The investigation & addressing of barriers to gender equality litigation in EU Member States.	
	I	Why?	1	1	
Up-to-date data is essential to empower women & healthcare professionals to make informed decisions about risks and benefits during pregnancy & lactation.	When enacted & monitored it will address women's underrepresentation in the labour market and support women as patients, employees & caregivers. Provisions on paternal, paternity & carer leave, & flexible working arrangements are integral to women before, during & after pregnancy.	Extended maternity leave has broad implications for maternal health, infant feeding, gender equality, workplaces, and society as a whole.	The need to prioritise measures to combat inequality among all women, in terms of age, socio-economic status, migration & citizenship situation, ethnicity, vulnerability, among others.	The number of cases brought to court are lower than despite legal protections & ensured access to courts in the EU.	

Support and Promote

Action 2: Prioritise maternal and infant health and wellbeing throughout the EU in programme and practice					
Recommendations					
6	7	8	9 Target programming that addresses chronic & infectious diseases, including supporting mental health during pregnancy & lactation		
Frame access to maternal health & women's autonomy under the umbrella of health as a human right	Prioritise maternal & infant health in the European work programme & in national strategies	Promote a positive approach to maternal health & wellbeing, including encouraging healthy behaviours & reducing the risk of complications			
	Но	w?			
Take action starting at critical points in childhood until old age. Explicitly target health inequities which impact maternal health and care.	Adopt a comprehensive strategic approach for making pregnancy safer for all women and support cross-national harmonisation. Policy learning between Member States should be facilitated.	Incorporate mental health into maternal health, and employ comprehensive national strategies must focus on key issues including health literacy, vaccination and obesity. Strengthen the EU Mandate on the coordination of_ health promotion, disease prevention and social solidarity which must be used and strengthened in order to promote maternal health and eliminate adverse outcomes.	Policies and programming must be developed to address issues including chronic disease, infectious disease, mental health, nutritional deficiencies, and domestic violence.		
Why?					
Pregnancy, maternal health, and health care should be prioritised as central rights-based events both within the life course and in social and economic life. Maternal health provides a psycho-social opportunity to empower women to make healthy lifestyle changes.	Maternal and infant health must be a theme in the Public Health Framework Programme. Member States must make maternal and infant health and wellbeing a priority in their national strategies.	Maternal health should be employed as an intervention point for health promotion to support women before, during and after pregnancy.	Taking steps to address these issues can prevent disease development during pregnancy, such as gestational diabetes and Strep B, and to safely manage pre-existing medical conditions and chronic disease.		

Protect and Empower

Action 3: Enable access to services and education relating to maternal and infant health					
Recommendations					
10	11	12	13	14	
Improve access to treatment & care, guaranteeing accessible & affordable services for all pregnant women & children	Promote multilingual, open-source information on maternal & infant health topics & services	Focus on accelerating the Health Literacy Agenda in Europe	Support an EU system on the safe use of medicines during pregnancy & lactation	Ensure that maternal & infant services & policies explicitly target vulnerable populations in their design & implementation	
		How?			
The European Child Guarantee in 2020 should be adopted in order to ensure that children have access to basic services, particularly during infancy.	Women and their families must be provided with the resources to support maternal and infant health and wellbeing before, during and after pregnancy and during lactation. Entitlements, services and resources should be mapped in an accessible manner	Focus on promoting the knowledge, motivation, and competence to access, understand, appraise, and apply health information.	At EU level establish a publicly-funded comprehensive European Pharmacovigilance system to collect data on the safe use of medicines during pregnancy and lactation.	Tailor services for better outcomes for both mother and child, recognising diversity rather than the "one-size fits all" approach. Take steps to reduce inequities, protect vulnerable populations and combat discrimination to reduce maternal mortality and morbidity.	
Why?					
All women, particularly those most vulnerable in Europe, should have affordable and quality access to antenatal, intrapartum, and postpartum care.	The is a need for increased promotion of health and well- being, including disease prevention across the lifespan, early intervention, vaccination and health literacy.	Health literacy is vital for citizens to make decisions on healthcare, disease prevention and health promotion.	Only about 5% of available medications have been adequately monitored, tested and labelled for use in pregnant and breastfeeding women.	Vulnerable and marginalised groups may have limited access to health and social care. Equity must underpin health and healthcare.	

Partner and Care

Action 4 :Ensuring common standards of care and fostering education and collaboration of key stakeholders across Europe to promote maternal and infant health for all						
Recommendations						
15	16	17	18	19		
Connect maternal care, public-patient involvement, & implementation science	Advocate for and implement European standards of maternal care	Improve health and social professional education on maternal health	Support the creation of a multi-stakeholder network on maternal health, wellbeing, and combating obesity	Holistic approaches incorporating multidisciplinary, multi-sectoral & "uncommon" stakeholders. Engage the community in programming.		
		How?				
Incorporate tools from PPI, implementation science, patient inclusion, and applied partnerships.	Implement high quality maternal services that comply with evidence- based guidelines for the provision of high-quality clinical care, including the provision of antenatal, intrapartum and postpartum care, induction of labour and caesarean section	Base education and training on the provision of high- quality clinical care, induction of labour, and caesarean section. Relevant stakeholders should be involved in developing and implementing curricula.	Bring together diverse stakeholders to contribute to the advancement of maternal and infant health by increasing awareness of preconception and maternal obesity.	Employ a community-lens in activities related to supporting healthy pregnancies and outcomes. Engage key stakeholders (government officials, regulatory agencies, academic institutions, NGOs, industry professionals, healthcare providers and pregnant women) in policy and programmes to support maternal health and wellbeing.		
Why?						
To foreground women's voices, and a person-centred approach.	Sharing best practice and effective strategies fosters culturally sensitive maternal care and a common framework for understanding barriers to care.	Training and education for health and social care professionals prevents maternal mortality and morbidity.	Early intervention supports improved nutrition across the life course, and a variety of stakeholder collaboration improves care quality and provision.	"Uncommon" stakeholders should be included to maximise impact and effectiveness and incorporate diversity.		

Research and Engage

Action 5: Pioneering research, thorough data collection and patient engagement, to underpin quality maternal health						
Recommendations						
20 Research the maternal health	21 Ensure more representative,	22 Evaluate the state of play of	23 Explicitly fund health research	24 Support Member States in the	25 Increase women and their families'	
system in Europe through a systems-thinking lens	high quality, sex, gender and age- disaggregated data. Support cross-national data and research.	maternal and infant health	on maternal and infant health – including biological, social, & economic factors	exchange of best practice for maternal health policy and programming.	involvement in maternal care and programming	
	1	Но	w?	1	1	
Conduct a systems level analysis of the entire health system across the EU, drawing on the WHO building blocks, including the health workforce, at primary, secondary, tertiary level.	Fund, collect, and analyse comparable cross- national data. Establish a reliable set of indicators, standardised terminology and definitions. Include sex, gender and age data disaggregation as a funding criterion.	A European Parliament commissioned study on maternal health, wellbeing and safety in the EU examining standards of care across Europe, ensuring that all pregnant women and infants have access to appropriate care.	Include maternal health and wellbeing in future Horizon Europe Programmes, including digital and e-health programmes.	Through policy learning networks.	Tailored programming to encourage and support pregnant women throughout their journey, including targeting work- life balance, combatting inequalities and reducing the risk of maternal mortality and morbidity.	
Why?						
To better understand current systems, challenges, needs, and best practices in maternal health and care across the EU.	Standardised processes produce more accurate data. Integrating sex and gender into research can be translated into regulatory and healthcare practice and equitable access to resources.	Maternal health should be integrated into the work of the European Parliament.	EU funding should ensure prioritisation of maternal health in all health systems, policies, and advocacies. EU MS must make maternal health and infant wellbeing a priority in multiannual financial frameworks	EU MS should be encouraged and supported to share best practice, working together to foster quality programming and address challenges.	Pregnancy offers a unique opportunity for public health promotion and disease prevention initiatives to be harnessed.	

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