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Full length article

Provision of antenatal care in Europe-A scientific study commissioned by European Board and College of Obstetrics and Gynaecology (EBCOG)

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ABSTRACT

Differences in the way health care delivery across countries may have important impacts on health outcomes and can result in inequalities. A questionnaire survey of members of national societies through EBCOG and EAPM was carried out in 2021. A total of 53 responses were received from 26 countries. Most countries reported that routine antenatal care is primarily delivered by medical staff, involving obstetric specialists or family doctors mostly in government-run facilities. Women from minority groups are able to access antenatal care easily in most countries. Less than 10% of women did not attend antenatal care throughout the pregnancy. Most booking for antenatal care takes place in the first trimester and the number of visits range from 6 to 10 depending on parity. Most countries provide routine ultrasound with 2–3 reported scans performed by specifically trained health care professionals. Facilities for prenatal screening/diagnosis of malformations in both low- and high-risk cases varied across Europe. While antenatal care is relatively standardized throughout Europe, important differences still exist in care delivery and accessibility to care. Antenatal preventive strategies appear to be variably available throughout Europe.

Introduction

The importance of antenatal care has been acknowledged by health care providers and policy makers for many decades. It is a combination of services that incorporates preventive measures, early detection of disease or deviation from normality, and general promotion of health by way of life-style advice. Antenatal care can therefore have an important role in improving health for current and future generations. It allows early identification and treatment measures to reduce the impact of pregnancy complications [1-3], thus improving pregnancy outcomes [4]. On the other hand, inadequate antenatal care has been shown to increase perinatal and maternal mortality [5]. Several different tools are used to evaluate the effective use of antenatal care, the Adequacy of Prenatal Care Use (APNCU) index and the Kessner Index being the most popular [6].

Standards of antenatal care have been published by leading scientific and professional organisations. The European Board & College of Obstetrics and Gynaecology (EBCOG) published its standards of care for Obstetrics and neonatal care in 2014 which were launched at the European Commission and these standards of care have provided guidance for the equitable access of antenatal care for all women within Europe [7]. EBCOG has long endorsed the public health value of antenatal care [8]. It recommends that all women should have an individualised plan of care by the 12th completed week of pregnancy, in order to assess and identify risk factors that may require focused care during pregnancy [9]. It recommends that more than 90% of women should receive

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standardised antenatal care and emphasised the need for early detection of maternal and fetal problems considering these as integral components of antenatal care. The importance of these services has already been recognised by the "Standards of Care and Position Statements Working Party" of the European Board and College of Obstetrics and Gynaecology [8].

Several differences exist between European countries in the general organisation and delivery of health care. EBCOG, the European Association of Perinatal Medicine (EAPM]) and the European Network of Trainees in Obstetrics and Gynaecology (ENTOG) were invited to form a study group to investigate health inequalities in Europe and obtain information on antenatal care provided to women across Europe. The aim of this study was to evaluate several key aspects of antenatal care, and to assess health promotion and disease prevention strategies during antenatal care in different European countries. Existing practice was then compared with guidelines or standards of care to allow us to make recommendations for the health care providers and policy advisors to implement changes.

Methods

An online questionnaire comprising 37 multiple-choice and open-ended key questions was prepared by representatives from EBCOG, EAPM and ENTOG [Appendix A]. The review included antenatal care service provision, and available preventive strategies. The questionnaire link was made available on-line to the EBCOG national societies and ENTOG national representatives during the period 28th December 2020 to 1st March 2021. The questionnaire was completed by 24 of the 37 EBCOG member countries. Descriptive analysis of reported data was carried out.

Results

A total of 53 responses were received from 26 countries. The number of births in each country during 2019 ranged from 4350 to 1,248,847 (Table 1). Respondents from seven countries were unable to provide the number of births in their countries. A comparison of the perinatal statistics from the various countries suggests that Turkey, Kyrgyzstan, and France reported markedly higher late fetal mortality rates, while Kyrgyzstan reported markedly higher early neonatal mortality rates. The other countries reported approximately similar perinatal mortality rates.

Table 1
National number of births and perinatal mortality rates in 2019.

Country	Number of births 2019	Late foetal mortality rate 2019	Early neonatal mortality rate 2019
Austria	84,952	2.2	1.9
Belgium	117,695	3.2 [2014]	1.6 [2014]
Cyprus	9,548	3.4 [2015]	1.6 [2015]
Czech Republic	112,231	2.6	1.0
Denmark	61,167	3.3 [2018]	2.1
Estonia	14,099	1.8	0.4
Finland	45,613	2.1	1.2
France	754,008	10.2 [2014]	2.0
Germany	778,090	3.8 [2015]	1.8
Greece	83,763	3.4	1.7
Ireland	59,289	2.7 [2016]	1.8 [2016]
Italy	420,084	2.7 [2012]	1.4 [2013]
Kyrgyzstan	173,484	9.1 [2015]	12.2 [2015]
Latvia	18,786	3.1	1.8
Malta	4,350	2.9	3.2
Norway	54,495	2.3	0.9
Poland	374,954	2.3	2.0
Portugal	86,579	2.3	1.2
Romania	199,720	3.1	2.3
Serbia	64,399	5.5	2.6
Slovakia	57,054	2.8	2.1
Slovenia	19,328	1.9	0.8
Spain	358,747	3.1	1.3
Turkey	1,183,652	7.3 [2015]	3.8
Ukraine	308,817	5.8	3.0
United Kingdom	712,699	4.2 [2017]	2.2 [2017]

A. Antenatal care service provision

Most countries reported that routine antenatal care was primarily delivered by medical practitioners including obstetricians and family doctors (Table 2). Belgium, Denmark, Estonia, Finland, Ireland, Spain, and the UK reported an active involvement of midwives in provision of routine antenatal care, alone or in conjunction with obstetricians or family doctors.

Public health care services, in government or university facilities, provide the larger proportion of antenatal care in most European countries (Table 2). Italy, Latvia, Malta, and Romania reported a public–private partnership; while Austria and Germany reported a predominance of private antenatal care, self-funded or covered by insurance.

Antenatal care within the public sector was available as a combination of both peripheral clinics and hospital outpatient services in most countries. Cyprus, Greece, and Kyrgyzstan reported antenatal care only in hospital outpatient services. Many countries allowed self-referral of women to antenatal care in public services. Cyprus, Denmark, Finland, France, Turkey, and the UK also allow referral by midwives or obstetric nurses. Malta, Slovenia, and Romania require referral from the family doctor or a specialist obstetrician. All countries except Kyrgyzstan reported that women from minority groups (migrant, teenager, etc.) can access antenatal care in the public sector with ease. Fifteen countries reported that access to the private sector was similarly easy for these women.

Antenatal care for low-risk women is provided by a midwifery-led service in Denmark, Estonia, Finland, France, Ireland, Norway, Spain, and the UK, while most countries provide a mixed midwifery-doctor antenatal care service for low-risk women. In Austria, Czech Republic, Kyrgyzstan, Poland, Portugal, Romania, Serbia, and Slovakia antenatal care for low-risk women is provided by a medical practitioner (Table 3). Antenatal care for high-risk women is provided by a midwifery-led service in Estonia and Kyrgyzstan. In Denmark, France, Ireland, Slovenia, Turkey, Ukraine, and the UK it is provided by a mixed midwifery-doctor service. In the remaining countries it is provided by a medical practitioner (Table 3).

Non-attendance to antenatal care rate was reported by all respondents as being generally under 10% of all pregnant women. The large majority of those booking for antenatal care do so in the first

Table 2
Primary provision of antenatal care in European countries.

Antenatal services	Number of countries	%
Antenatal care provider		
Medical practitioner only	19	73.1
Midwife practitioner involvement	7	26.9
Health care provision services		
Public services [government/university]	21	80.9
Public-private partnership	4	15.4
Private care provision	2	7.7
Place of antenatal care in the public sector		
Combined district clinics and hospitals	23	88.5
Hospital clinic	3	11.5
Self-referral policy	20	76.9
Easy accessibility to minority groups		
Public sector facilities	25	96.1
Private sector facilities	15	57.7

Table 3
Main provision of antenatal care in low- and high-risk pregnancies.

Antenatal care	Low risk pregnancies		High risk pregnancies	
	Number of countries	%	Number of countries	%
Midwifery-led	8	30.8	2	7.7
Mixed midwifery-doctor	10	38.4	7	26.9
Medical practitioner-led	8	30.8	17	65.4

trimester, with the exceptions being Slovakia, Czech Republic, Romania, and Norway. Most of the countries report having established national guidelines of delivery of antenatal care, the exceptions being Romania, Serbia, and Spain.

Most countries provide antenatal care in 6–10 routine outpatient visits for low-risk nulliparous and multiparous women. None offers less than 6 visits to nulliparous women while Romania, Latvia, Ireland, and the UK offer less than 6 visits to multiparous women. Austria, Cyprus, and Finland offer more than 10 visits for both nulliparous and multiparous women (Table 4).

Table 5 presents information about available antenatal support services. Life-style advice is provided during the first antenatal visit in all countries except Spain. The Czech Republic, Norway, Portugal, Romania, Spain, Serbia, Greece, and Germany do not offer parentcraft classes routinely to all pregnant women. Most countries offer information packs or online information resources with up-to-date evidence-based information to help women make informed decisions regarding their antenatal care. Exceptions are the Czech Republic, Germany, Poland, Romania, Serbia, and Spain. Printed information packs are available in the national language/s in all countries except the Czech Republic, Poland, Romania, Serbia, Spain, Finland, and Greece. Online resources are also available except in the Czech Republic, Poland, Romania, Serbia, Spain, and Austria. Information packs are available for migrant women in their native language except in the Czech Republic, Poland, Romania, Serbia, Spain, Austria, Greece, Latvia, Portugal, Slovakia, Belgium, and the Ukraine. Interpreter services are routinely available in all countries except Poland, Romania, Latvia, Portugal, Ukraine, Malta, and Slovenia.

Facilities are available to refer pregnant women with special needs to the appropriate support services, including social, psychological, educational, and psychiatric services, in most countries. A standard policy for managing women who fail to re-attend antenatal care is in place in some countries (Table 4). A birthing plan is routinely developed with pregnant women in most countries. Exceptions include Austria, Czech Republic, Finland, Greece, Germany, Norway, and Romania. A regional or national system for auditing antenatal care outcome indicators is in place in most countries. Exceptions are Austria, Greece, Latvia, Portugal, Romania, and Spain (Table 5).

All the participating countries reported having to introduce Covid-19 sensitive antenatal care changes during the pandemic period. These changes have not however generally involved modifying the antenatal visit frequency. Eight countries – Estonia, Italy, Latvia, Kyrgyzstan, Romania, Spain, Ukraine, and the U.K. reported changing the schedule of antenatal visits and modifying antenatal ultrasound frequency.

Table 4
Number of routine antenatal outpatient visits in nulliparous and multiparous women.

Antenatal care	Nulliparous		Multiparous	
	Number of countries	%	Number of countries	%
<6 visits	0	0	4	15.4
6–8 visits	11	42.3	9	34.6
9–10 visits	12	46.2	10	38.5
>10 visits	3	11.5	3	11.5

Table 5
Provision of antenatal support services.

Antenatal support service	Number of countries	%
Life-style advice	25	96.2
Parentcraft classes	18	69.2
Information pack available for pregnant women	20	76.9
In national language	19	73.1
In on-line resources	20	76.9
Dedicated migrant services		
Availability of information packs in migrant languages	14	53.9
Interpreter services	19	73.1
Easy availability of social/psychological/educational services	21	80.8
Availability of standard antenatal records	25	96.1
Standard policy for non-attenders	11	42.3
Development of a birthing plan		
With all women	17	65.4
With high-risk women only	13	50.0
System for auditing outcome indicators	20	76.9

B. Preventive strategies

A standard operating procedure (SOP) or hospital policy and guidance to address any risk identified during the delivery of antenatal care is regularly applied to the provision of antenatal care in all respondent countries except Austria, Romania, and Slovenia (88.5%). Most countries (76.9%) reported that the first risk assessment is carried out by an Obstetric specialist responsible for the care (Table 6).

Ultrasound scanning policy

Most countries (61.6%) provide routine ultrasound investigation opportunities with 2–3 reported scans being done in a normal pregnancy. One country, Norway, reported offering less than 2 scans. Nine countries, including Turkey, UK, Ukraine, Slovenia, Slovakia, Spain,

Table 6
Risk assessment facilities.

Risk assessment facilities	Number of countries	%
• Availability of a SOP to address risk identification	23	88.5
• Risk category assessment done by Obstetric specialist	20	76.9
• Routine antenatal U/S throughout pregnancy		
o >1 scan	1	3.8
o 2–3 scans	16	61.6
o 3–7 scans	7	26.9
o >7 scans	2	7.7
• Routine first U/S scan		
o Done in first trimester <14 weeks	24	92.3
o Done after during second trimester	2	7.7
• Routine follow-up U/S scan		
o Done in 2nd trimester	24	92.3
o Done in 3rd trimester	18	69.2

Serbia, Poland, and Greece, reported offering more than 3 scans during the antenatal period with the latter two offering >7 scans.

Twenty-four countries (92.3%) reported that an ultrasound scan is routinely done in the first trimester of pregnancy before 14 weeks gestation while Norway and Romania reported doing scans at 14–18 weeks and 19–24 weeks respectively. Most countries (92.3%) reported that a follow-up routine ultrasound scan is done in the late second trimester of pregnancy at about 19–24 weeks, while Austria reported repeating a routine scan only in the third trimester. Eighteen countries (69.2%) reported that a routine follow-up ultrasound scan is carried out in the third trimester of pregnancy (Table 7). All routine ultrasound scans are generally performed by specifically trained health care professionals that include obstetric-trained ultrasonographers such as a trained nurse, midwife, radiologist or doctor and specialist obstetricians. No country reported obstetric scans as being done by a specialist non-obstetric radiographer.

Prenatal screening for fetal abnormalities

All the countries have facilities for prenatal screening/diagnosis of malformations in both low- and high-risk cases. These facilities included:

- Biochemical tests were generally offered routinely in most countries (61.5%), though Ireland, Norway, and Slovenia offered these facilities only on patient request to low-risk cases but routinely to high-risk cases. France, Romania, Kyrgyzstan, Germany, and Malta offered these tests only on patient request.
- Second trimester amniocentesis service was offered to low-risk cases on patient request by Belgium, Denmark, Estonia, Latvia, Portugal, Turkey, Ukraine, United Kingdom, France, Romania, Slovenia, Kyrgyzstan, and Germany. 65.4% of the countries offered this service to high-risk cases. Portugal, France, Romania, Kyrgyzstan, Germany, and Malta offered these on patient request only; while no response was received from Czech Republic, Finland, and Greece.
- Non-invasive prenatal testing (NIPT) is offered on patient request for low-risk cases by most of the countries (84.6%) notably Austria, U.K., Cyprus, Italy, Slovenia, Denmark, Estonia, Latvia, Portugal, Turkey, Ukraine, France, Romania, Slovenia, Kyrgyzstan, Germany, Czech Republic, Serbia, Poland, Ireland, Malta, and Greece. No response was received from Finland, Ireland, and Norway. In contrast only half of the countries (50.0%) offered NIPT services routinely to high-risk cases; the remainder offered these services on patient request (Austria, Poland, Italy, Serbia, Cyprus, Portugal, France, Romania, Kyrgyzstan, Malta, Greece, and Ukraine).
- 1st trimester ultrasound assessment is offered by the majority (96.1%) of the countries to both low (except Norway offered on patient request) and high-risk cases (except France offered on patient request).
- 2nd trimester anomaly ultrasound scan is generally offered in all countries to low-risk (92.3%) and high-risk cases (96.1%). France offered the service on patient request whether the case was low or high-risk; Romania offered the investigation on patient request in low-risk cases but offered it routinely in high-risk cases.

Table 7
Prenatal screening/diagnosis for malformations.

Prenatal screening for malformations	Low risk pregnancies		High risk pregnancies	
	Number of countries	%	Number of countries	%
Biochemical tests				
• Offered routinely	16	61.5	19	73.1
• On patient request	8	30.8	5	19.2
• No response sent	2	7.7	2	7.7
2nd trimester amniocentesis				
• Offered routinely	6	23.1	17	65.4
• On patient request	13	50.0	6	23.1
• No response sent	7	26.9	3	11.5
NIPT				
• Offered routinely	1	3.9	13	50.0
• On patient request	22	84.6	12	46.1
• No response sent	3	11.5	1	3.9
1st trimester U/S scan				
• Offered routinely	25	96.1	25	96.1
• On patient request	1	3.9	1	3.9
2nd trimester anomaly U/S scan				
• Offered routinely	24	92.3	25	96.1
• On patient request	2	7.7	1	3.9

Protocols for preventive strategies

Table 8 shows the availability of defined protocols for preventive strategies for preterm birth, late onset preeclampsia, vaginal birth after caesarean section and pregnancy complications following artificial reproductive technique.

Screening for gestational diabetes

All the countries reported having a system in place for screening for gestational diabetes. The majority (61.5%) relied upon OGTT 1-stage screening at 26–28 weeks alone or in combination with clinical risk-based screening and/or fasting blood glucose/random blood glucose testing at booking and/or subsequent visits. Two countries - Kyrgyzstan and Serbia - relied primarily on clinical risk-based screening; while the remainder, including Belgium, Denmark, Estonia, France, Slovakia, Slovenia, Ukraine, and UK, reported relying on OGTT 2-stage screening in the 1st and 2nd trimester (Table 8). GDM screening also generally remained the same as pre-pandemic times in 21 out of the 26 countries.

Discussion

The present study shows a variation in access to antenatal care services between different European countries. This does not necessarily indicate deficiencies in health care systems in some of them but a different approach to management according to the local prevailing practices. In our survey, all countries affirmed having a routine national antenatal care service which complies with international and European guidelines. All countries reported at least 6 visits for multiparous women. There were however discrepancies in the number of visits for nulliparous women, as more than 40% of countries provided eight visits or less which is not consistent with the recent World Health Organization (WHO) recommendations suggesting a minimum of eight visits

Table 8
Preventive strategies protocols for high-risk cases.

Preventive strategies protocol availability	Number of countries	%
• Premature birth	23	88.5
• Pre-eclampsia	24	92.3
• Mental health disorders	18	69.2
• GDM	25	96.2
o 1-stage OGTT screening at 26–28 weeks +/− clinical and/or biochemical risk-based screening	16	61.5
o clinical risk-based screening	2	7.7
o 2-stage OGTT screening in the 1st and 2nd trimester	8	30.8
• Congenital malformation	22	84.6
• Intrapartum problems [e.g., VBAC]	19	73.1
• ART pregnancies	18	69.2

during the antenatal course [10]. The present finding that in Europe, most antenatal services for low-risk pregnancies are dependent on a medical practitioner is not compatible with the International Federation of Gynaecology and Obstetrics (FIGO) recommendation that a midwife or a nurse should be involved [11]. However, for high-risk pregnancies, the proportion of countries reporting a solely midwife-led service was in this survey less than 10%.

The EBCOG Standards of Care-Obstetrics and Neonatal Services recommend that assessment by a specialist should be available for women with complex disorders such as smoking, drug/alcohol problems, domestic abuse, language barriers and provision of psychological support [7,12]. In our study, most countries were following these recommendations and facilities are easily available to refer women with special needs to the appropriate support services, namely social, psychological, educational, psychiatric, and other services.

The available literature reports that minority groups can be particularly disadvantaged with lower use of antenatal care [13-16]. Nguyen et al noted that minorities receive more prenatal education but still have disparities in adverse perinatal outcomes [17]. In line with EBCOG [7] and FIGO recommendations [9] on the provision of non-discriminatory care to all women, especially to vulnerable groups including ethnic minorities and immigrants, all participating countries in the present survey reported that they provide easy access to public antenatal health care services to minorities. This is an important and favourable circumstance to achieve high quality of care to all women in Europe.

It is important for health care professionals to provide preconception counselling and lifestyle advice before and during pregnancy with up-to-date evidence-based information [18-24]. EBCOG emphasises that lifestyle advice should be available to all women, but especially to overweight and obese patients, and recommends that health care service providers should provide healthy lifestyle advice, particularly on diet and physical activity, to all women planning to embark on a pregnancy [25]. In agreement with that EBCOG and FIGO recommendations [26], the present study has shown that all countries, except one, are giving life-style advice during the first antenatal visit. Effective antenatal education is also an important part of antenatal care where self-responsibility has become the principle of antenatal education [27]. WHO encourages that all pregnant women should have a written birthing plan that covers emergencies, complications, and unexpected adverse events [28]. The present survey has shown that in more than half of the countries a birthing plan is routinely developed in collaboration with the women but only half of the countries represented routinely developed a birthing plan in high-risk cases. This can reflect lack of education or readiness in antenatal care provision in Europe. In most countries, however, a system of practice audit is in place. Though the details of these audits were not inquired upon, birthing plan provision could be a missing indicator. EBCOG recommends that national data are collected in such a way that would enable comparison between European countries.

Systemic documentation of medical records by health care providers is generally enforced by local or national health administration entities. Documentation of medical records is in many aspects very important for patient's care [29]. Since this information is sensitive and private, many legal and ethical issues can be impacted by its maintenance [30]. Nevertheless, it is generally considered as patient's property who thus can obtain this information upon request. FIGO recommends the review, update, or introduction of standard antenatal care service registers, and to ensure that there is availability of these records [11]. The present survey has shown that a standard antenatal record is made available to the mother in almost all countries except in Romania where these records are not available to patients. However, a standard policy protocol for managing women who fail to re-attend their antenatal care is in place in only 11 of the 26 participating countries. The provision and maintenance of good antenatal records is essential for quality assurance and regular auditing that can enhance patient safety.

Maternal and fetal assessments are essentials components of antenatal care, and a planned assessment is necessary to avoid unexpected results. EBCOG recommendations on Standards of Care Obstetrics and Neonatal Services states that a needs-and-risk assessment should be carried out at booking and at each subsequent antenatal visit [7,8]. WHO recommends assessing women to develop preventive strategies for many medical disorders as well as for gestational diabetes and pre-eclampsia [10]. EBCOG recommends all antenatal units to have clearly defined protocols for the care of all women [7,8]. On the other hand, EBCOG and UNFPA have also published guidance about screening women during pregnancy for perinatal mental health [12]. From our survey, it seems that most of the countries are following this guidance and have a standard operating procedure. Defined protocols for preventive strategies for all pregnant women are essential and EBCOG states that all health professionals should have a clear understanding of risk assessment and management [7,8]. It is recommended that by including medical, obstetric, gynaecological, and social history, maternal characteristics, and current pregnancy events as part of protocol, an individual's risk and need assessment can be done [7,8]. The EURO-Peristat report shows that there has been an increase in risk factors associated with a premature birth, development of pre-eclampsia, mental health disorders, gestational diabetes etc. for childbearing women from 2010 to 2015 [31]. When we compare our results of having risk assessments in place and outcomes provided by EURO-Peristat, not all data coincide. For example, the risk assessment of having premature birth is not available in Austria, Ireland, and Latvia, but neonatal mortality rates were highest in Bulgaria and Romania. The different data can be due to the fact that we do not know if all risks that affect maternal and neonatal mortality are assessed or not, and that the ones previously mentioned might not be reflecting pregnancy outcomes. Another reason can be that these countries have adapted their assessment systems after 2015, i.e., after the latest EURO-Peristat report was published. WHO has reported that maternal and perinatal mortality rate has decreased significantly between 2000 and 2015 in Europe, though there are still important differences between countries and correct reporting is still not yet universal [10].

Prenatal testing using screening and diagnostic tests can be applied during the first or the second trimester [32]. EBCOG recommends all women to be offered comprehensive antenatal screening and diagnostic testing including serum biochemical tests and ultrasound scan [8]. A fetal ultrasound scan in the first trimester permits early fetal assessment, screening, and diagnosis of fetal karyotypic abnormality [33]. The increase in early systemic evaluation of structural abnormalities has led to decreasing invasive testing rates [34]. First trimester and 2nd trimester anomaly scans, offered routinely as a part of prenatal care to recognize fetal abnormalities, are recommended by the International Society of Ultrasound in Obstetrics and Gynaecology (ISUOG) [35-38]. EBCOG recommends that all women should be offered an early ultrasound scan followed by a mid-trimester second ultrasound scan [8], while WHO recommends an ultrasound scan before 24 weeks [10]. In our survey, we divided prenatal testing into 5 subgroups and enquired as to which kind of testing was provided to low risk and high-risk patients. These subgroups were biochemical tests, 2nd trimester amniocentesis, NIPT, 1st trimester U/S and 2nd trimester anomaly scan. All countries who contributed to our survey the availability of facilities to provide prenatal testing to both low and high-risk groups. Biochemical testing, 2nd trimester amniocentesis and NIPT were commonly offered on patients' request. Accordingly, with these recommendations, twenty-four out of twenty-six countries reported offering an ultrasound scan in the 1st trimester and almost all countries offered the 2nd trimester anomaly scan routinely. From our results, we can see that most of the European countries are following EBCOG's antenatal screening recommendations.

Diabetes in pregnancy including gestational diabetes has been discussed thoroughly for many years, being the most common medical condition that affects pregnant women complicating pregnancy [39-42]. Many associations including EBCOG, WHO, FIGO, the International Association of Diabetes in Pregnancy Study Groups (IADPSG), and the

American Diabetes Association [ADA] are commending those women should receive screening at their first prenatal visit, especially in high-risk groups [43-49]. Accordingly, we had affirmation from all countries that a system for screening GDM was in place. To evaluate screening and diagnosis for GDM across Europe and to evaluate if the 2013 WHO criteria for GDM are implemented, EBCOG had conducted an online survey in 2016 [43]. Outcomes of that survey showed that most European societies had national or regional guidelines for GDM and had adopted the 2013 WHO criteria. They have concluded that achieving uniformity in GDM screening and diagnosis across Europe is important. EBCOG has worked very closely with FIGO and EAPM to promote the policy of universal screening for gestational diabetes. In 2018 at the 26th European EBCOG Congress, EBCOG and the European Diabetes in Pregnancy Study Group (DPSG), supported by FIGO, released the Paris Consensus on Gestational Diabetes Mellitus screening wherein universal screening for GDM using a one-step approach was recommended on the IADPSG-WHO2013 evidence-based criteria [46]. In this survey, we have noticed that most countries are following this recommendation and relied upon OGTT 1-stage screening at 26–28 weeks. Although it is clear that GDM screening has been improved in the past years, there are still steps to be taken to have uniformity across Europe so that *all* countries will be using the same screening tools.

The COVID-19 pandemic which is caused by severe acute respiratory syndrome coronavirus 2 infection (SARS-CoV-2) has challenged perinatal health, both directly by infection itself and because of sensitive health care changes necessary during this period. A global cross-sectional study showed that there was a significant reduction in antenatal care during the pandemic [50]. We have found in our survey that all countries reported having to introduce changes during the pandemic, which generally did not include decreasing schedule of antenatal visits and ultrasound scan frequency. Our outcomes coincide with literature, wherein continued antenatal care has been advised to pregnant women along with general advice given to the rest of the population [51].

A weakness of the present study could be considered its descriptive style without including the investigation of the main causes which led to the noted inter-country divergence of practices. In addition, this study uses a simple questionnaire as the main tool. Nevertheless, important data have emerged from the use of this tool, which for the first time supports the indications for diversity in health care provision in Europe on which the foundation of EBCOG was based, and this is a strong point of the study. From the present analysis it is understood that most European countries are moving in the same direction in terms of key practices for adequate antenatal care. However, there are a minority of countries that deviate from this and use different practices. It should be noted that the composition of this minority is not stable throughout the data analysis but changes with the differentiation of the parameters of antenatal care. This makes the urgent need for harmonization EBCOG's main mission. Despite the uncertainty and lack of statistical documentation, the research sample used in the present study is a representative of the population of the participating countries, since the information was provided by the National Societies that are official members of EBCOG.

Conclusions

Antenatal care is an essential part of health care services that includes many aspects of care and has an important role on the health of current and future generations. Health inequalities can be prevented with a unified effort. This paper identifies areas of variation and provides important information for providers of health care to reduce variation by improving standards of care and harmonising access to antenatal care in line with published international guidelines. National and international societies should influence policy makers at national and European level to commission services based on quality standards. Preventive strategies are an essential part of antenatal care. By having in place risks-and-needs assessments, early interventions and implementation of international recommendations and guidelines, maternal and perinatal morbidity and mortality can be decreased. Prevention of health inequalities can be achieved with a unity effort. Local, national, and international societies with the support of governments can achieve the goal of providing harmonised antenatal care services in Europe.

Authors' contribution to the research

G. Topcu wrote the first draft of the paper; C. Savona-Ventura helped with questionnaire design, analysed the data, and reviewed the paper, D. Ayres-de-Campos, S. Mukhopadhyay, I. Messinis, and T. Mahmood helped with questionnaire design and reviewed paper, while O.A. Cassar and S. Grixti Sultana helped with the questionnaire design.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ejogrb.2022.03.009.

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