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CHARACTERISTICS OF CHILDBEARING WOMEN

3.   CHARACTERISTICS OF CHILDBEARING WOMEN

CORE
Multiple birth rate by number of fetuses (C7)
Distribution of maternal age (C8)
Distribution of parity (C9)

RECOMMENDED
Percentage of women who smoke during pregnancy (R8)
Distribution of maternal prepregnancy body mass index (R12)

RECOMMENDED INDICATORS NOT INCLUDED IN THIS REPORT
Distribution of mothers' educational level (R9)
Distribution of parents' occupational classification (R10)
Distribution of mothers' country of birth (R11)

The demographic and social characteristics of childbearing women are related to a wide range of pregnancy outcomes, including mode of delivery and maternal and neonatal mortality and morbidity. Interpreting variations in indicators of obstetric and neonatal care and outcomes between countries requires information about the characteristics of the population of pregnant women.

Euro-Peristat selected three core indicators, considered essential for describing the childbearing population – women with multiple pregnancies, maternal age, and parity – as well as five recommended indicators. Although this report focuses on the core indicators, we also present data on two of the recommended indicators – smoking and maternal prepregnancy BMI. The other three recommended indicators – mother's educational level, parental occupational status, and mother's country of birth – will be published later.

In the following section we introduce each indicator and describe the rationale for the choice and its impact on perinatal outcomes. The three recommended indicators that are not presented provide important information on the social context, which affects perinatal outcomes within countries and therefore provides a measure of social inequalities in health. Euro-Peristat has shown with data from 2010 that stillbirth rates throughout Europe are higher among women with lower educational or occupational levels (see section on stillbirth, C1).

C7   MULTIPLE BIRTHS BY NUMBER OF FETUSES

JUSTIFICATION

Compared with singletons, babies from multiple pregnancies have much higher rates of stillbirth, neonatal mortality, infant mortality, preterm birth, low birth weight, congenital anomalies, and long-term health and developmental problems associated with complications of the perinatal period. Rates of multiple birth vary between countries and over time. They are influenced by differences in the proportions of older women giving birth (see C8), because the probability of a multiple pregnancy increases with age. Older women also experience more subfertility and are more likely to use ART. The extent of use of ovarian stimulation and assisted conception and the policies for preventing multiple pregnancies with ART are therefore also major determinants of rates of multiple pregnancy in the population. Use of subfertility procedures is rising across Europe and policies related to their use differ from country to country;[4] for instance, elective single embryo transfer (eSET) has been extensively promoted in several countries, including Belgium, the Czech Republic, Sweden, Finland, and Austria, and recent studies comparing the use of eSET between countries show its impact on the incidence of multiple pregnancies.[5]

DEFINITION AND PRESENTATION OF INDICATOR

Figure 7.1 shows the rates of twin and triplet and higher-order births, expressed as numbers of women with twin and with triplet or higher-order births per 1000 women giving birth to one or more fetuses.

DATA SOURCES AND AVAILABILITY OF INDICATOR IN EUROPEAN COUNTRIES

All countries provided data for this indicator. Greece, Hungary, and Romania provided data by births and not by pregnant women, so we estimated the rates of multiple maternities from birth data (by dividing by 2 for twins and 3 for triplets). Data came primarily from medical birth registers and perinatal databases as well as from civil registration systems. Most countries had no missing data or a very minimal number of women with missing data.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THE INDICATOR

The pregnancies included in civil registration systems depend on the laws governing the births requiring registration. These affect the extent to which multiple births in which one or more babies die before birth or registration are included. In addition, multiple births are rare events. In small populations such as those of Cyprus, Iceland, Luxembourg, and Malta, year-to-year random variations will be greater and confidence intervals around the rates wide. In comparing these data with other data sources, it is important to note that the multiple birth rate is sometimes presented with births as the denominator (rather than pregnant women, as in the Euro-Peristat definition).

RESULTS

Multiple birth rates varied from below 15 per 1000 women with live births or stillbirths in Romania, Slovakia, Poland, Greece, Finland, Lithuania, Scotland, Northern Ireland, and the Czech Republic to more than 20 per 1000 in Cyprus (27/1000) and Spain (22/1000) in 2015, as shown in Figure C7.1, which also provides the number of women in each country with information on this indicator. For triplets and more, Cyprus had the highest rate (0.9/1000) in 2015, and Greece, Estonia, Slovakia, the Czech Republic, Latvia, and Finland the lowest rates (around 0.1/1000). The median twin rate was 16.4/1000 with an interquartile range (IQR) between 14.5 and 17.4, and the

triplet rate was 0.2 per 1000 with an IQR of 0.2 to 0.3. Median rates were similar for 2010, 16.4 per 1000 and 0.3 per 1000, respectively, but changes over time differed. Figure C7.3 presents risk ratios between the two years with 95% confidence intervals for twin pregnancy rates; significant decreases of 10% or more in twinning rates were observed in Austria, Slovakia, Finland, Denmark, and the Czech Republic. Increases of 10% or more were observed in Ireland, Romania, Portugal, and Latvia. The heterogeneity between countries in rates between the two periods was statistically significant.
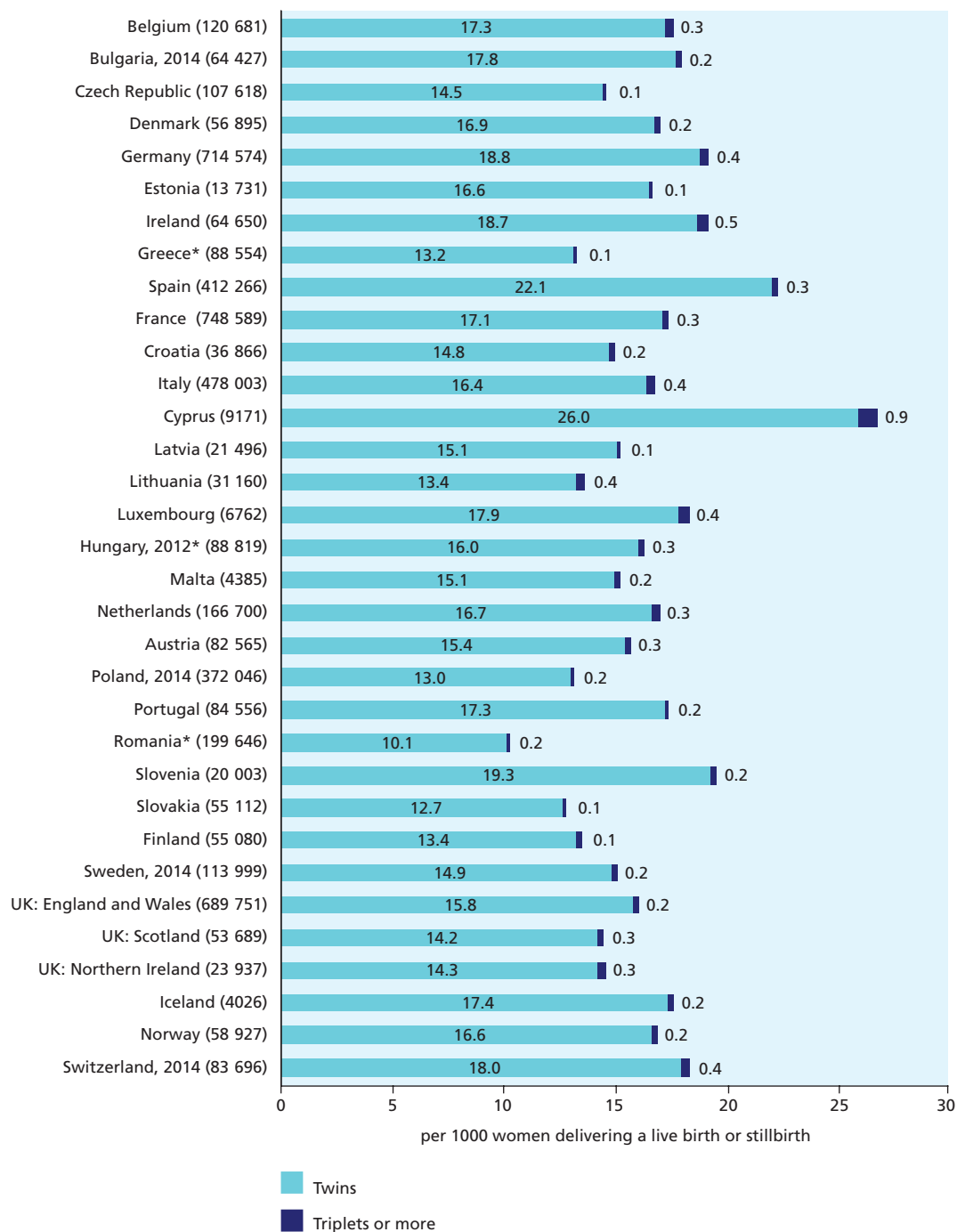
KEY POINTS

- Perinatal complications associated with multiple births impose considerable costs on health services, families, and societies. Accordingly, the high rates due to either delayed childbearing or subfertility management raise questions about the need for policies to encourage earlier childbearing and to prevent multiple pregnancies in assisted conception.

- The decrease in twinning rates in some countries may be the result of policies to reduce the risks of multiple births for women undergoing subfertility procedures; more knowledge about how these policies are contributing to the changes in the multiple birth rate would be useful for health professionals and policy makers.

- In the absence of data about ovarian stimulation and assisted conception, age-specific multiple birth rates can provide an indication of the extent of their use.

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Figure C7.1   Multiple birth rates per 1000 women with live births or stillbirths by number of fetuses in 2015

Country	Twins	Triplets or more
Belgium (120 681)	17.3	0.3
Bulgaria, 2014 (64 427)	17.8	0.2
Czech Republic (107 618)	14.5	0.1
Denmark (56 895)	16.9	0.2
Germany (714 574)	18.8	0.4
Estonia (13 731)	16.6	0.1
Ireland (64 650)	18.7	0.5
Greece* (88 554)	13.2	0.1
Spain (412 266)	22.1	0.3
France (748 589)	17.1	0.3
Croatia (36 866)	14.8	0.2
Italy (478 003)	16.4	0.4
Cyprus (9171)	26.0	0.9
Latvia (21 496)	15.1	0.1
Lithuania (31 160)	13.4	0.4
Luxembourg (6762)	17.9	0.4
Hungary, 2012* (88 819)	16.0	0.3
Malta (4385)	15.1	0.2
Netherlands (166 700)	16.7	0.3
Austria (82 565)	15.4	0.3
Poland, 2014 (372 046)	13.0	0.2
Portugal (84 556)	17.3	0.2
Romania* (199 646)	10.1	0.2
Slovenia (20 003)	19.3	0.2
Slovakia (55 112)	12.7	0.1
Finland (55 080)	13.4	0.1
Sweden, 2014 (113 999)	14.9	0.2
UK: England and Wales (689 751)	15.8	0.2
UK: Scotland (53 689)	14.2	0.3
UK: Northern Ireland (23 937)	14.3	0.3
Iceland (4026)	17.4	0.2
Norway (58 927)	16.6	0.2
Switzerland, 2014 (83 696)	18.0	0.4

per 1000 women delivering a live birth or stillbirth

■ Twins

■ Triplets or more

NOTE: Numbers in parentheses are number of women for whom there were data about multiple pregnancy (all stated).
* Estimated from data on babies.

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Figure C7.2   Twin birth rates per 1000 women in 2010 and 2015

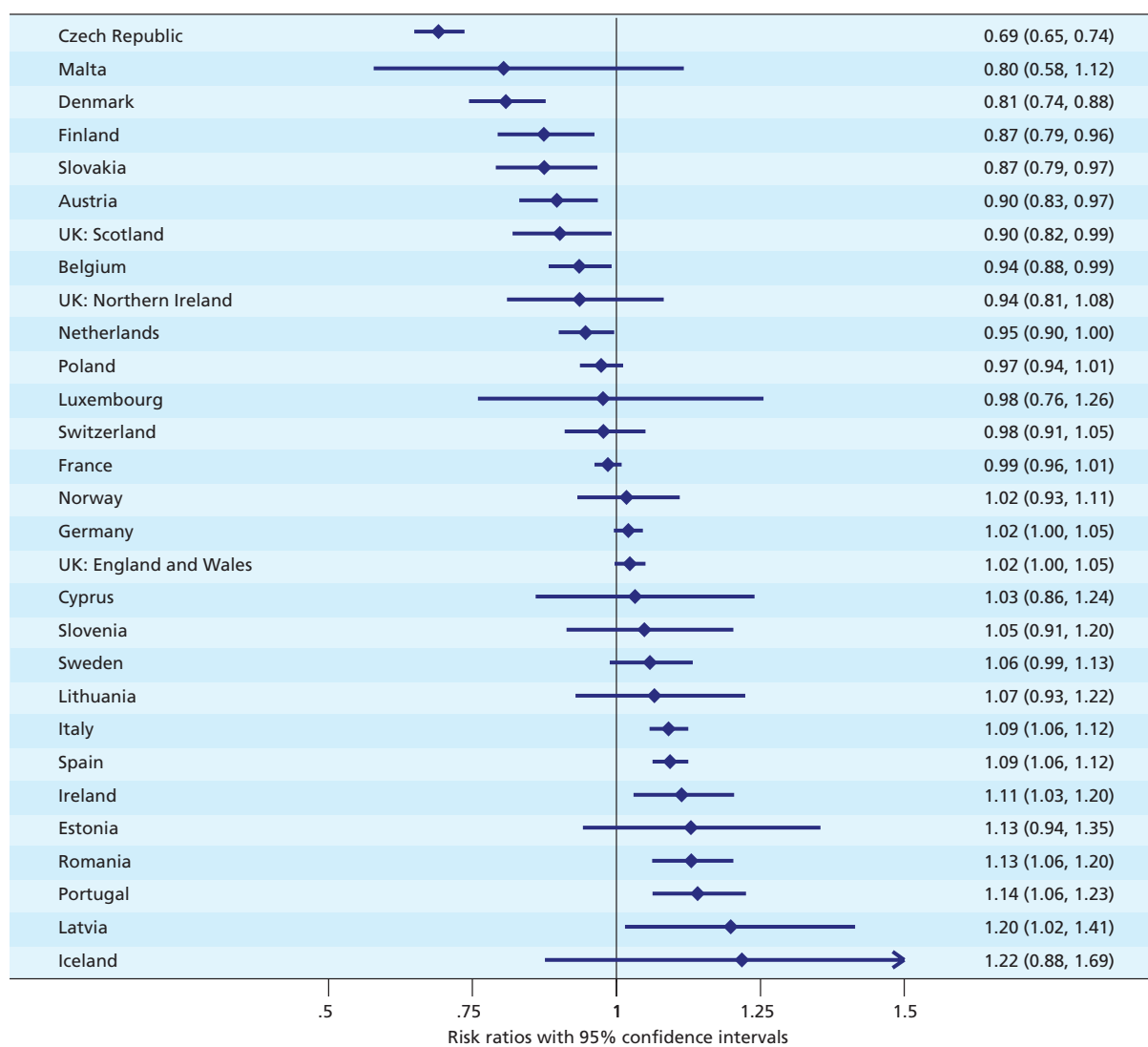| Country	2010	2015
Czech Republic	21.0	14.5
Denmark	20.9	16.9
Malta	18.7	15.1
Finland	15.3	13.4
Slovakia	14.5	12.7
Austria	17.2	15.4
UK: Scotland	15.8	14.2
Belgium	18.5	17.3
UK: Northern Ireland	15.3	14.3
Netherlands	17.7	16.7
Luxembourg	18.3	17.9
Switzerland	18.4	18.0
Poland	13.4	13.0
France	17.4	17.1
Norway	16.4	16.6
UK: England and Wales	15.4	15.8
Germany	18.5	18.8
Lithuania	12.5	13.4
Sweden	14.0	14.9
Cyprus	25.1	26.0
Slovenia	18.5	19.3
Romania	9.0	10.1
Italy	15.0	16.4
Spain	20.2	22.1
Estonia	14.7	16.6
Ireland	16.8	18.7
Portugal	15.1	17.3
Latvia	12.6	15.1
Iceland	14.3	17.4

per 1000 women delivering a live birth or stillbirth

2010
2015

NOTES: Countries sorted by rate difference between 2010 and 2015.
First-period data not from 2010: Cyprus 2007.
Second-period data not from 2015: Bulgaria 2014, Hungary 2012, Poland 2014, Sweden 2014, Switzerland 2014.

Figure C7.3   **Comparison of twin pregnancy rates, 2010 and 2015 (risk ratios and 95% confidence intervals)**

Czech Republic	0.69 (0.65, 0.74)
Malta	0.80 (0.58, 1.12)
Denmark	0.81 (0.74, 0.88)
Finland	0.87 (0.79, 0.96)
Slovakia	0.87 (0.79, 0.97)
Austria	0.90 (0.83, 0.97)
UK: Scotland	0.90 (0.82, 0.99)
Belgium	0.94 (0.88, 0.99)
UK: Northern Ireland	0.94 (0.81, 1.08)
Netherlands	0.95 (0.90, 1.00)
Poland	0.97 (0.94, 1.01)
Luxembourg	0.98 (0.76, 1.26)
Switzerland	0.98 (0.91, 1.05)
France	0.99 (0.96, 1.01)
Norway	1.02 (0.93, 1.11)
Germany	1.02 (1.00, 1.05)
UK: England and Wales	1.02 (1.00, 1.05)
Cyprus	1.03 (0.86, 1.24)
Slovenia	1.05 (0.91, 1.20)
Sweden	1.06 (0.99, 1.13)
Lithuania	1.07 (0.93, 1.22)
Italy	1.09 (1.06, 1.12)
Spain	1.09 (1.06, 1.12)
Ireland	1.11 (1.03, 1.20)
Estonia	1.13 (0.94, 1.35)
Romania	1.13 (1.06, 1.20)
Portugal	1.14 (1.06, 1.23)
Latvia	1.20 (1.02, 1.41)
Iceland	1.22 (0.88, 1.69)

Risk ratios with 95% confidence intervals

NOTE: Overall random effects estimate: 0.99 (95% CI: 0.95, 1.03).
I^2=92.6% Chi squared tests of heterogeneity: 378.65 (d.f. = 28), p <.001.
First-period data not from 2010: Cyprus 2007.
Second-period data not from 2015: Bulgaria 2014, Hungary 2012, Poland 2014, Sweden 2014, and Switzerland 2014.

C8 MATERNAL AGE AT DELIVERY

JUSTIFICATION

Both early and late childbearing are associated with higher than average rates of preterm birth, growth restriction, and perinatal mortality.[1-4] Younger mothers are more likely to have low social status, unwanted or hidden pregnancies, inadequate antenatal care, and poor nutrition. Older mothers have a higher risk of multiple births, as described in indicator C7, of some congenital anomalies, and of pregnancy complications, including hypertension and diabetes. Maternal morbidity and mortality are highest among the youngest and oldest women. Older mothers have caesarean deliveries more often. The risks of younger age are mainly observed among very young mothers.[4] For older mothers, risks rise more acutely after age 40.[5]

Because of the association between maternal age and perinatal health outcomes and because the age at which women in European countries bear children differs widely, the maternal age distribution should be taken into account in comparisons between countries. Furthermore, mothers are increasingly having children later in life throughout Europe, and this could affect trends in perinatal health indicators.

Policy issues include integrating into prenatal care services that address the specific needs of older pregnant women and providing information about the risks associated with early and delayed childbearing. Younger mothers may be exposed to less favourable social conditions, which have long-term consequences for themselves and their children. The prevention of teenage pregnancy is a policy concern in some countries of Europe, but many others have already attained very low rates.[6] The challenges of managing later childbearing are widely shared across European countries.

DEFINITION AND PRESENTATION OF INDICATOR

This indicator is defined as the distribution of age in years at delivery for women delivering a live born or stillborn baby. The recommended presentation is: 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, and 45 and older. This summary presentation focuses on the extremes of the childbearing distribution, defined as younger than 20 years and 35 years and older.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THIS INDICATOR

Some civil registration systems record the age the mother reaches during the year of birth and not her age at delivery. In some situations, age may be recorded during antenatal visits but not updated at delivery. These data are presented in relation to total births in the Czech Republic and Greece and to live births in Hungary and Romania, rather than to women, as recommended by Euro-Peristat. The differences between these two numbers are due to multiple births, which are a relatively small proportion of total births even among women aged 35 or more, so this is not a major problem.

Data in France come from hospital statistics in 2015 and also from a representative survey in 2016, to enable a comparison with data provided in 2010, which came from the 2010 version of the same survey.

DATA SOURCES AND AVAILABILITY OF INDICATOR IN EUROPEAN COUNTRIES

All countries were able to provide this indicator. Data correspond to births in 2014 in Bulgaria, Poland, Sweden, and Switzerland and in 2016 in France for the comparison with 2010.

RESULTS

The percentage of mothers aged younger than 20 varied from 0.8% in Switzerland to 10.2% in Bulgaria. This percentage was 9.7 in Romania, 6.3 in Hungary and Slovakia, and under 4 in the other countries (Figure C8.1). The median percentage was 2.1% with an IQR of 1.4% to 3.5%. The percentage of older mothers, defined as women giving birth at 35 years or older, ranged from about 14% in Bulgaria, Poland, and Romania to 36.3% in Italy and 37.3% in Spain. The median for all countries was 20.8, with an IQR of 18.9 to 23.3. The group of women aged between 25 and 34 years, at the lowest perinatal risk, is proportionally small (53% to 55%) in Bulgaria and Hungary because of the high proportion of women under 25, and in Ireland, Spain, and Italy because of the high proportion of births to women aged 35 or more.

Figures C8.2 and C8.3 provide a geographical representation of the distribution of maternal age at childbirth in participating countries based on the percentages of younger and older mothers. These figures show clustering of countries in eastern Europe, where women are having children at earlier ages, as well as higher proportions of older mothers in southern Europe.

Having children later in life is a general trend in Europe (Figure C8.4). Only four countries (Estonia, Germany, the Netherlands, and Sweden) experienced a decrease between 2010 and 2015 in the percentage of women aged 35 years or more, and the absolute decrease was less than 1%. The increase was large with an absolute increase of about 8% in Portugal and Spain. This change is more pronounced when seen as a relative change, as in Figure C8.5, which presents risk ratios between the two years with 95% confidence intervals. The pooled measure of change for all the countries participating in Euro-Peristat is 1.16 (1.11-1.20), with highly significant heterogeneity.
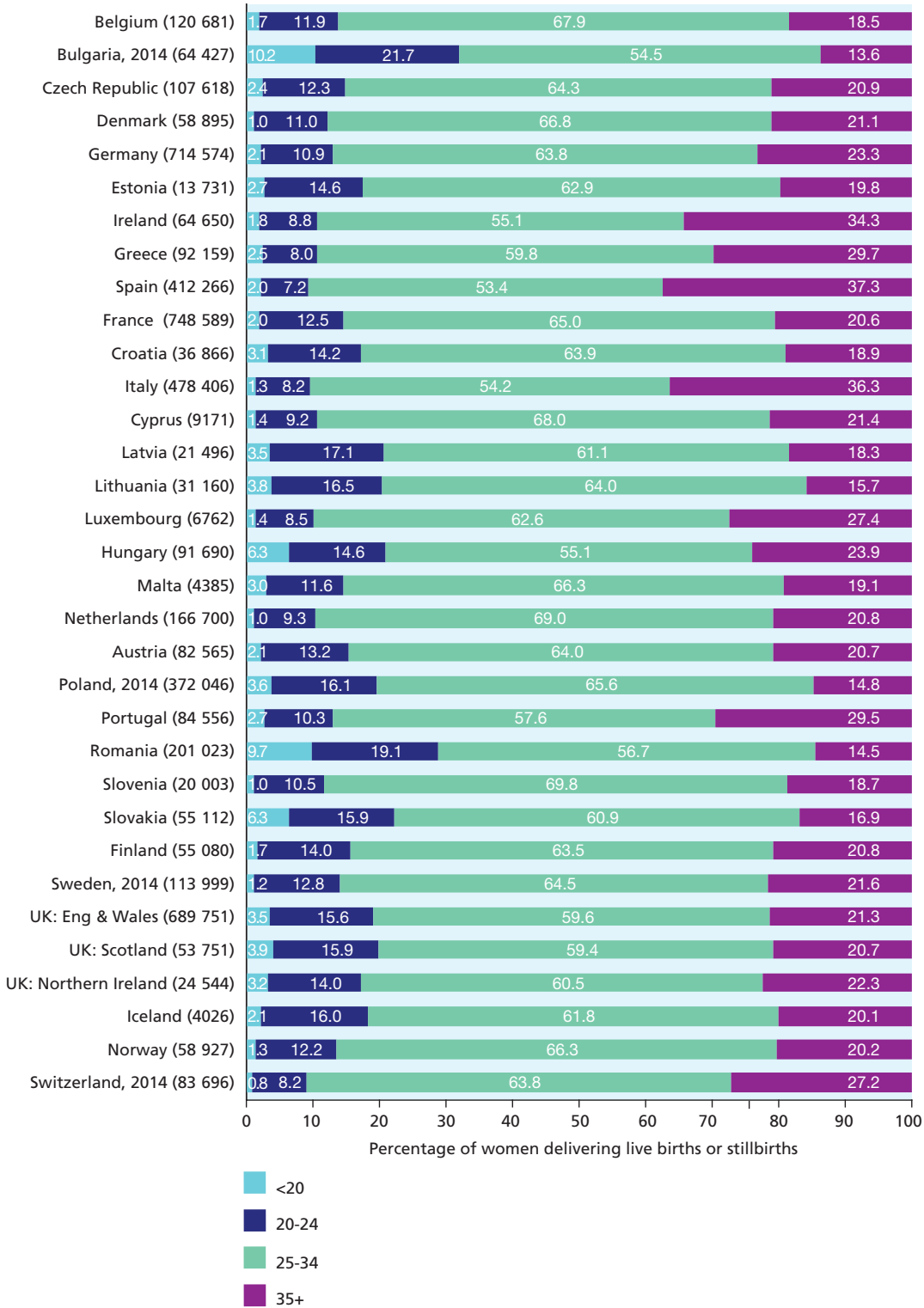
KEY POINTS

- In more than 60% of the countries in Euro-Peristat, births to teenage mothers account for less than 3% of all deliveries.
- The proportion of women bearing children later in life varies substantially but in over 60% of countries, at least one in every five births was to a women aged 35 years or older, and the percentage of births to women in this age group increased substantially in almost every country.
- Policies should be developed to inform young women of the consequences of having children later in life so that they can make informed choices about when to have their children.
- Encouraging earlier childbearing may also require policies to support young parents and working mothers. Health services in countries with a higher percentage of women having babies at older ages need to make sure their health needs are met during pregnancy.

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Figure C8.1   Age distributions of women delivering live births or stillbirths in 2015

Country (number)	<20	20-24	25-34	35+
Belgium (120 681)	1.7	11.9	67.9	18.5
Bulgaria, 2014 (64 427)	10.2	21.7	54.5	13.6
Czech Republic (107 618)	2.4	12.3	64.3	20.9
Denmark (58 895)	1.0	11.0	66.8	21.1
Germany (714 574)	2.1	10.9	63.8	23.3
Estonia (13 731)	2.7	14.6	62.9	19.8
Ireland (64 650)	1.8	8.8	55.1	34.3
Greece (92 159)	2.5	8.0	59.8	29.7
Spain (412 266)	2.0	7.2	53.4	37.3
France (748 589)	2.0	12.5	65.0	20.6
Croatia (36 866)	3.1	14.2	63.9	18.9
Italy (478 406)	1.3	8.2	54.2	36.3
Cyprus (9171)	1.4	9.2	68.0	21.4
Latvia (21 496)	3.5	17.1	61.1	18.3
Lithuania (31 160)	3.8	16.5	64.0	15.7
Luxembourg (6762)	1.4	8.5	62.6	27.4
Hungary (91 690)	6.3	14.6	55.1	23.9
Malta (4385)	3.0	11.6	66.3	19.1
Netherlands (166 700)	1.0	9.3	69.0	20.8
Austria (82 565)	2.1	13.2	64.0	20.7
Poland, 2014 (372 046)	3.6	16.1	65.6	14.8
Portugal (84 556)	2.7	10.3	57.6	29.5
Romania (201 023)	9.7	19.1	56.7	14.5
Slovenia (20 003)	1.0	10.5	69.8	18.7
Slovakia (55 112)	6.3	15.9	60.9	16.9
Finland (55 080)	1.7	14.0	63.5	20.8
Sweden, 2014 (113 999)	1.2	12.8	64.5	21.6
UK: Eng & Wales (689 751)	3.5	15.6	59.6	21.3
UK: Scotland (53 751)	3.9	15.9	59.4	20.7
UK: Northern Ireland (24 544)	3.2	14.0	60.5	22.3
Iceland (4026)	2.1	16.0	61.8	20.1
Norway (58 927)	1.3	12.2	66.3	20.2
Switzerland, 2014 (83 696)	0.8	8.2	63.8	27.2

Percentage of women delivering live births or stillbirths

Legend:
- <20
- 20-24
- 25-34
- 35+

NOTE: In parentheses: the number of women with data for age at delivery.

Figure C8.2   Mothers aged <20 years as a percentage of all pregnancies with known maternal age in 2015
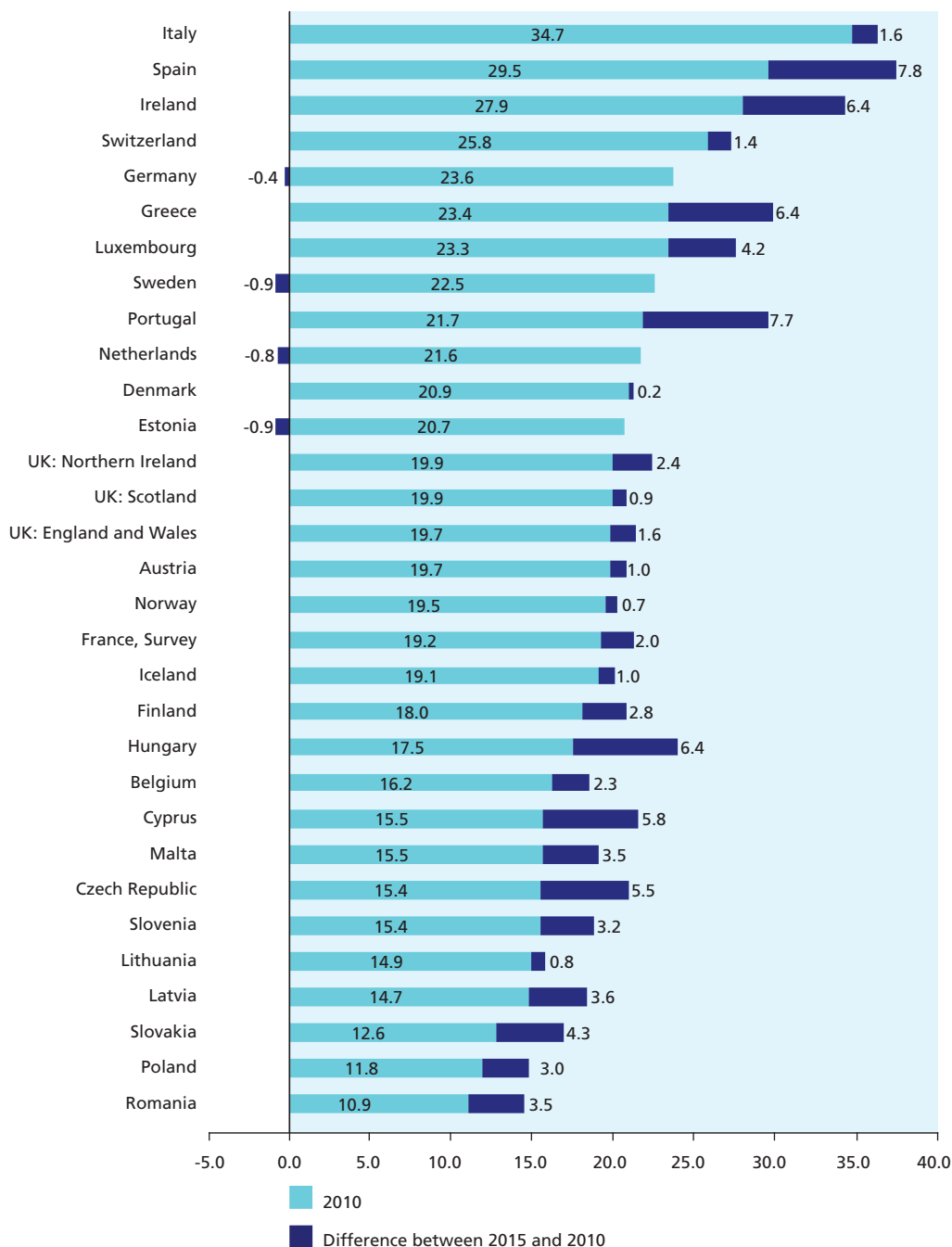

Iceland

Malta

Cyprus

<20 years %

- 3.7–10.2
- 2.8–3.6
- 2.2–2.7
- 1.8–2.1
- 1.1–1.7
- 0.8–1.0
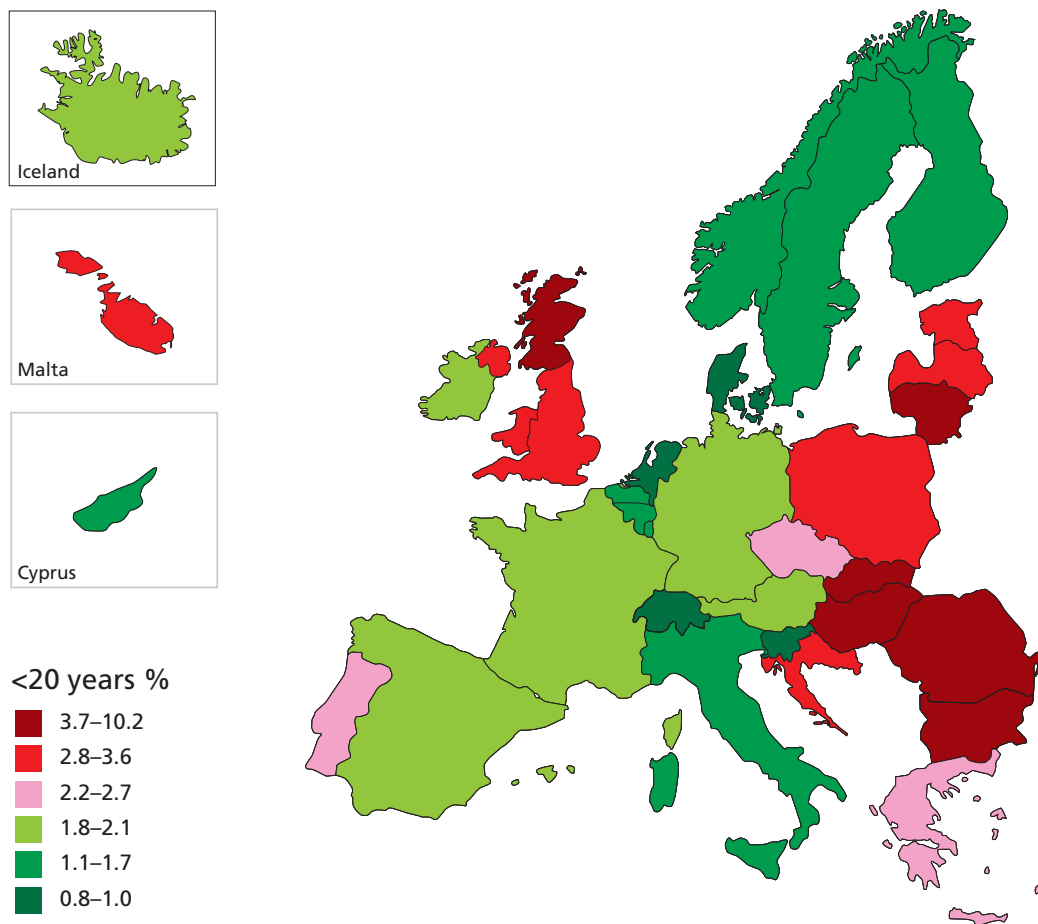
Figure C8.3   **Mothers aged ≥ 35 years as a percentage of all pregnancies with known maternal age in 2015**

Iceland

Malta

Cyprus

≥ 35 years %

- 29.6–37.3
- 21.5–29.5
- 20.8–21.4
- 19.2–20.7
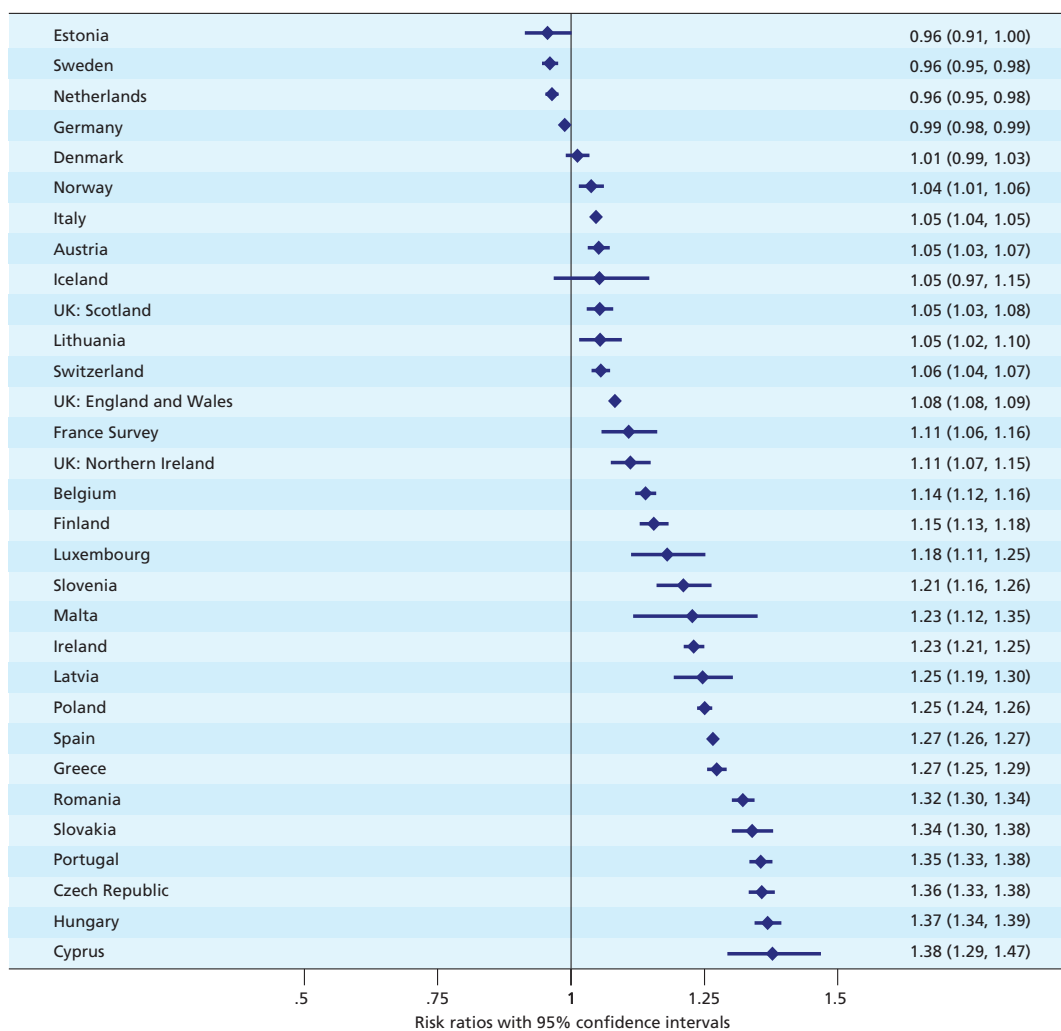- 17.0–19.1
- 13.6–16.9
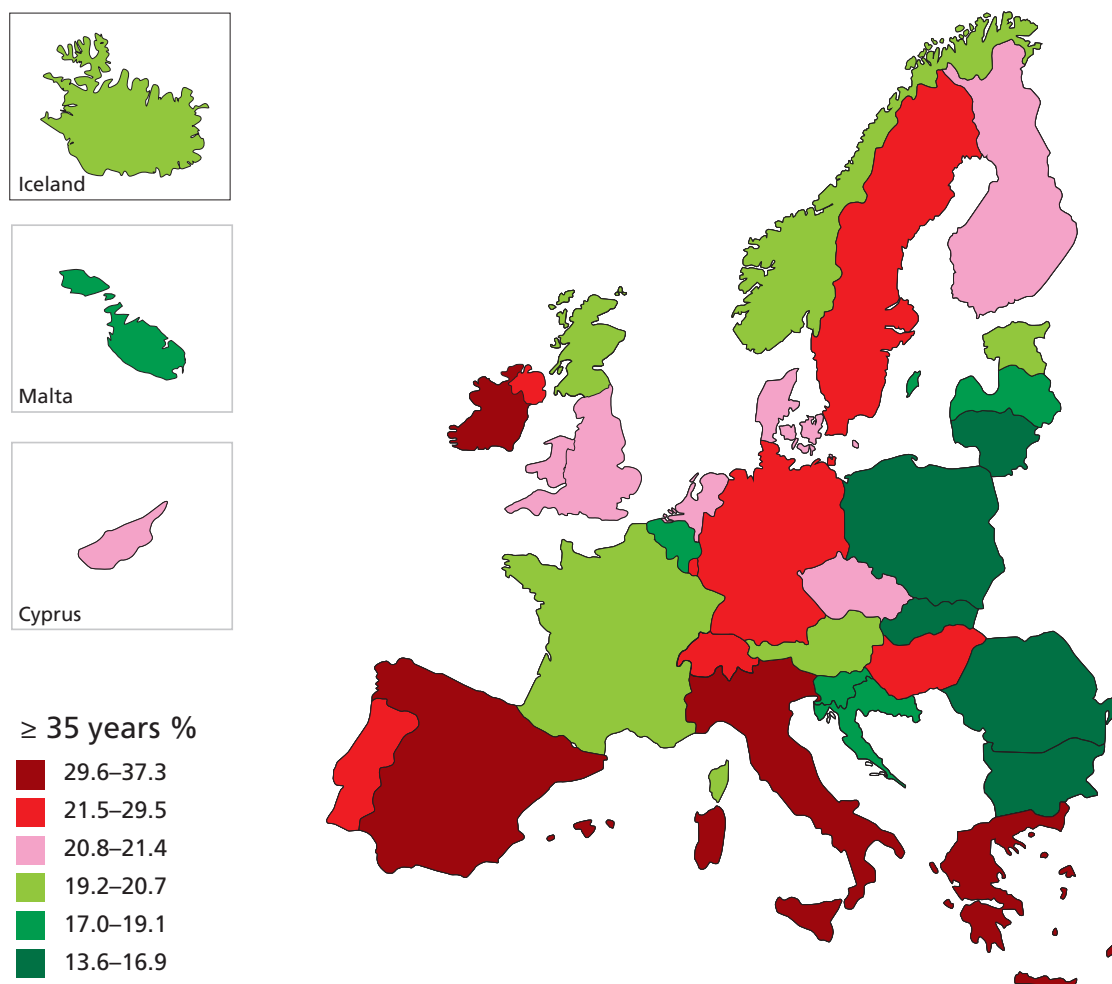
Figure C8.4   Percentage of mothers aged ≥ 35 years in 2010 and differences between 2010 and 2015

NOTES: First-period data not from 2010: Greece 2009, Cyprus 2007.
        Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.

Figure C8.5   Comparison of the percentages of mothers aged ≥ 35 years, 2010 and 2015 (risk ratios and 95% confidence intervals)

Country	Risk ratio (95% CI)
Estonia	0.96 (0.91, 1.00)
Sweden	0.96 (0.95, 0.98)
Netherlands	0.96 (0.95, 0.98)
Germany	0.99 (0.98, 0.99)
Denmark	1.01 (0.99, 1.03)
Norway	1.04 (1.01, 1.06)
Italy	1.05 (1.04, 1.05)
Austria	1.05 (1.03, 1.07)
Iceland	1.05 (0.97, 1.15)
UK: Scotland	1.05 (1.03, 1.08)
Lithuania	1.05 (1.02, 1.10)
Switzerland	1.06 (1.04, 1.07)
UK: England and Wales	1.08 (1.08, 1.09)
France Survey	1.11 (1.06, 1.16)
UK: Northern Ireland	1.11 (1.07, 1.15)
Belgium	1.14 (1.12, 1.16)
Finland	1.15 (1.13, 1.18)
Luxembourg	1.18 (1.11, 1.25)
Slovenia	1.21 (1.16, 1.26)
Malta	1.23 (1.12, 1.35)
Ireland	1.23 (1.21, 1.25)
Latvia	1.25 (1.19, 1.30)
Poland	1.25 (1.24, 1.26)
Spain	1.27 (1.26, 1.27)
Greece	1.27 (1.25, 1.29)
Romania	1.32 (1.30, 1.34)
Slovakia	1.34 (1.30, 1.38)
Portugal	1.35 (1.33, 1.38)
Czech Republic	1.36 (1.33, 1.38)
Hungary	1.37 (1.34, 1.39)
Cyprus	1.38 (1.29, 1.47)

Risk ratios with 95% confidence intervals

NOTE: Pooled random effects estimate: 1.16 (95% CI: 1.11-1.20).
I²=99.6% Chi squared tests of heterogeneity: 7611.48 (d.f. = 30), p < 0.001.
First-period data not from 2010: Greece 2009, Cyprus 2007.
Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.

C9 DISTRIBUTION OF PARITY

JUSTIFICATION

Parity refers to a women's number of previous births. Women with no previous births and giving birth for the first time are described here as primiparous and women with one or more previous births as multiparous. Compared with multiparous women, primiparous women have a higher incidence of some pregnancy complications and conditions, such as hypertension and preeclampsia, as well as higher than normal risks of adverse outcomes, such as low birth weight, fetal growth restriction, preterm birth, and stillbirth.[1,2] Primiparity is also associated with a greater use of health services during pregnancy and with health behaviour, including greater adherence to recommendations about folic acid supplementation, smoking cessation, and attendance for antenatal care.[3-5] Use of obstetric interventions differs as well. Primiparous women have higher rates of caesarean births than multiparous women, although the magnitude of this difference differs between countries (see C10).[6] Caesarean delivery in the first pregnancy has a major impact on the risk of caesareans in subsequent pregnancies, with caesarean rates for multiparous women with a uterine scar ranging from 40% to 94% in Euro-Peristat countries in 2010.[6] Similar trends appear for 2015 (see C10). Grand multiparae, defined as women with 4 or 5 previous births, may also face greater risks of poor pregnancy outcome, although this has not been observed in all studies.[2,7]

Fertility patterns influence the distribution of parity, and countries with lower fertility rates will have higher proportions of primiparous women. Parity should therefore be considered in comparing health outcomes between low and high fertility countries or across time when fertility is changing, for it may mean higher overall rates of adverse outcomes in populations where fertility is lower.

DEFINITION AND PRESENTATION OF INDICATOR

Parity is defined as the number of previous total live births and stillbirths (0, 1, 2, or 3+ births) for women having a live birth or a stillbirth.

DATA SOURCES AND AVAILABILITY OF INDICATOR IN EUROPEAN COUNTRIES

Most countries were able to provide data on parity. Greece, Hungary, Lithuania, Romania, and Bulgaria provided data on parity at the level of the child (number of births) rather than the mother. Spain could provide the proportions of primiparous and multiparous women, but did not have details about the number of previous births for multiparous women. Most countries had low proportions of missing data.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THE INDICATOR

There are differences in the definition of parity related to the way in which previous multiple births are counted.[8] In obstetrics, previous births most often refer to the number of pregnancies,[9] meaning that twins would be counted as one birth whereas demographers and some health databases tend to refer to number of babies, ie, twins are counted as two births.[10] When extracting data from routine sources it is usually not possible to distinguish which of these definitions are used, and there is confusion among clinicians about how to measure parity.[8] Data from Finland, where it is possible to compute this indicator based on both definitions, however, show that the difference in definition does not have a large impact on the distribution of this indicator (Table C9.1). When the number of births is used, there are slightly more high-parity women.

Other issues are related to the omission of stillbirths, as many civil registration systems do not count previous stillbirths as a birth in the computation of parity (for instance, Switzerland); similarly, there are different gestational age cutoffs for defining what constitutes a birth. This may differ between countries, for instance, starting at 20 weeks, 22 weeks, or 24 weeks. Nonetheless, these births are infrequent and unlikely to have a large impact.

RESULTS

The percentages of women giving birth for the first time ranged from lows of 38%-39% in Ireland, Northern Ireland, and England and Wales to over 50% in Bulgaria, Italy, Portugal, Spain, Malta, and Romania, as shown in Figure C9.1. The median in participating European countries was 47.4%. Fewer than 3% of women had three or more previous births in Italy, Portugal, Slovenia, or Switzerland, compared with 9% or more in Ireland, Slovakia, Finland, and the UK (England, Wales, and Northern Ireland). The percentage of women with four or more previous births ranged from less than 1% to over 4% in Slovakia, Finland, and Romania (see Table C9 in Appendix B).

Figure C9.2 displays the percentages of primiparous women in 2010 and their differences in 2010 and 2015. For most countries, there was a slight decrease or no change. In Latvia, Scotland, the Netherlands, Ireland, Sweden, and Northern Ireland, however, the percentage of primiparous mothers decreased by 3 percentage points or more. Figure C9.3, which presents risk ratios between the two years with 95% confidence intervals, illustrates the larger number of countries experiencing slight decreases. The pooled measure of change across all the countries in Europe is 0.98 (0.97-0.99), with highly significant heterogeneity.

KEY POINTS

- As fertility is relatively low in Europe, more attention is paid to women giving birth for the first time and the risks associated with it than to women with several previous births.
- The percentage of primiparous women ranges from about 38% to 54% in participating countries, and this may affect perinatal indicators, given the higher risks, on average, experienced by women in their first pregnancy.
- Since 2010, the percentage of primiparous women among all childbearing women has decreased slightly or stayed stable in most countries.

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Table C9.1   **Differences in distribution of parity when calculated based on previous deliveries or previous births in Finland in 2015**

	Previous deliveries (pregnancies)		Previous births (babies)	
	N	%	N	%
0	22 856	41.6	22 856	41.6
1	18 885	34.3	18 746	34.1
2	7921	14.4	7839	14.3
3	2684	4.9	2627	4.8
4 or more	2661	4.8	2939	5.3

Source: National Institute for Health and Welfare, Medical Birth Register 2015. Data on previous deliveries are based on mothers' self-report, verified from the Medical Birth Register. Data on previous births come from the Medical Birth Register 1987-2015, which takes live births and stillbirths in multiple pregnancies into account.

Figure C9.1   Distribution of parity in 2015

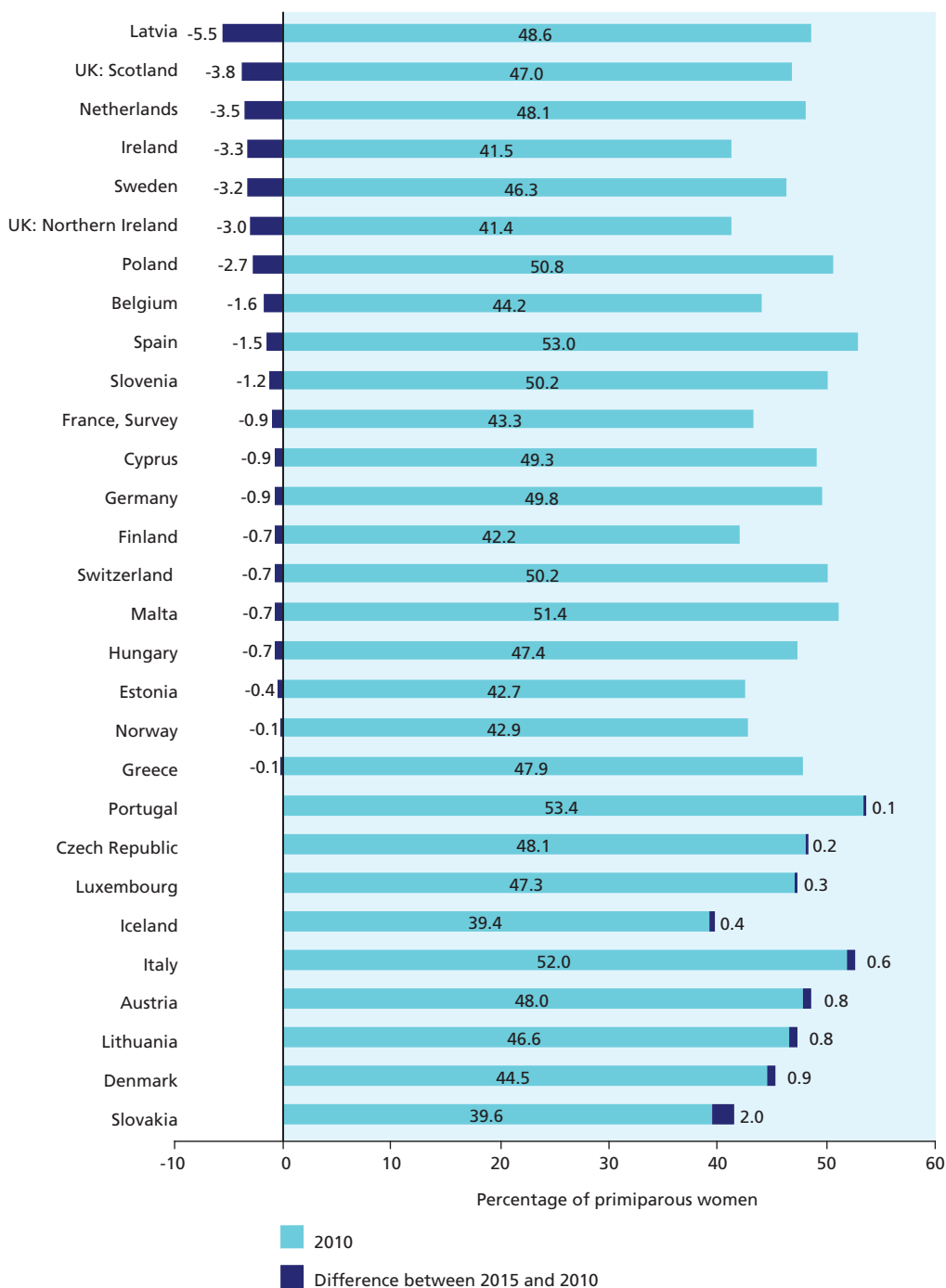| Country	0	1-2	3+
Belgium (120 681)	42.5	49.3	8.2
Bulgaria*, 2014 (65 602)	51.2	43.6	5.2
Czech Republic (107 618)	48.3	47.0	4.6
Denmark (56 895)	45.5	50.2	4.3
Germany (714 574)	49.0	45.6	5.4
Estonia (13 731)	42.3	51.6	6.1
Ireland (64 650)	38.2	52.6	9.2
Greece* (92 159)	47.8	48.8	3.4
Spain*** (412 266)	51.5		
France, Survey 2016 (13 077)	42.5	49.7	7.9
Croatia (36 866)	49.0	45.3	5.7
Italy (478 406)	52.7	44.4	2.9
Cyprus (9171)	48.4	47.5	4.1
Latvia (21 496)	43.1	51.2	5.7
Lithuania* (31 601)	47.4	48.2	4.3
Luxembourg (6762)	47.6	47.3	5.1
Hungary* (91 690)	46.7	45.8	7.5
Malta (4385)	50.7	44.3	5.0
Netherlands (166 700)	44.6	49.5	5.8
Austria (82 565)	48.8	46.4	4.8
Poland, 2014 (372 046)	48.1	47.5	4.4
Portugal (84 556)	53.5	43.7	2.8
Romania* (201 760)	54.5	37.8	7.8
Slovenia (20 003)	49.0	48.0	3.0
Slovakia (55 112)	41.7	49.1	9.3
Finland (55 080)	41.6	48.7	9.7
Sweden, 2014 (113 999)	43.1	50.9	6.0
United Kingdom			
UK: England and Wales (689 751)	38.8	51.6	9.6
UK: Scotland (53 751)	43.2	49.3	7.5
UK: Northern Ireland (24 544)	38.4	52.5	9.1
Iceland (4026)	39.8	53.9	6.4
Norway (58 927)	42.7	51.6	5.7
Switzerland, 2014 (83 696)	49.5	47.5	2.9

Percentage of women with a stillbirth or live birth

Legend:
- 0
- 1-2
- 3+

Notes: * Based on babies not mothers.
        ** Based on live births only.
        *** Can only identify primiparous vs. multiparous
        (numbers in parentheses: women with live births and stillbirths)
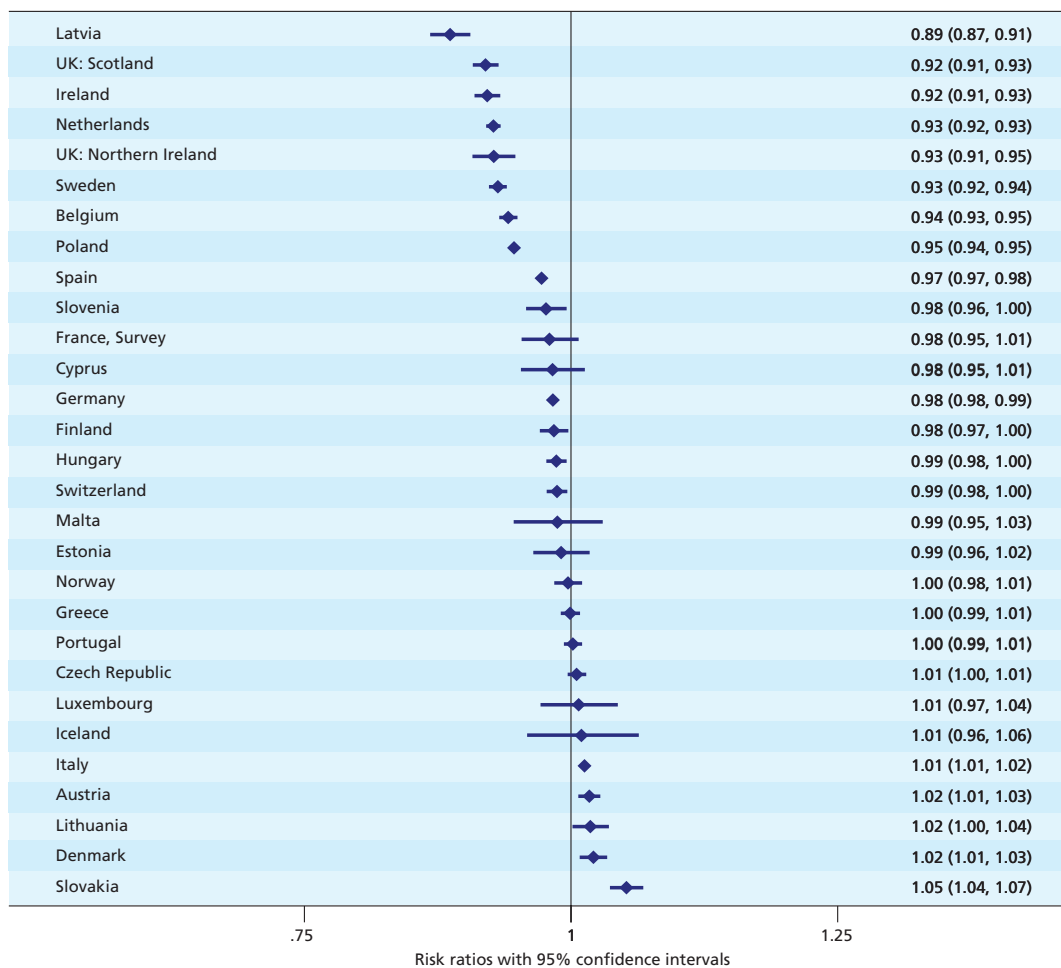
Figure C9.2   Differences between the percentages of primiparous mothers in 2010 and 2015

Country	2010	Difference between 2015 and 2010
Latvia	48.6	-5.5
UK: Scotland	47.0	-3.8
Netherlands	48.1	-3.5
Ireland	41.5	-3.3
Sweden	46.3	-3.2
UK: Northern Ireland	41.4	-3.0
Poland	50.8	-2.7
Belgium	44.2	-1.6
Spain	53.0	-1.5
Slovenia	50.2	-1.2
France, Survey	43.3	-0.9
Cyprus	49.3	-0.9
Germany	49.8	-0.9
Finland	42.2	-0.7
Switzerland	50.2	-0.7
Malta	51.4	-0.7
Hungary	47.4	-0.7
Estonia	42.7	-0.4
Norway	42.9	-0.1
Greece	47.9	-0.1
Portugal	53.4	0.1
Czech Republic	48.1	0.2
Luxembourg	47.3	0.3
Iceland	39.4	0.4
Italy	52.0	0.6
Austria	48.0	0.8
Lithuania	46.6	0.8
Denmark	44.5	0.9
Slovakia	39.6	2.0

Percentage of primiparous women

■ 2010

■ Difference between 2015 and 2010

NOTE: Countries sorted by rate difference between 2010 and 2015.
First-period data not from 2010: Cyprus 2007.
Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.

Figure C9.3   Comparison of the percentages of primiparous women, 2010 and 2015 (risk ratios with 95% confidence intervals)

	Risk ratio (95% CI)
Latvia	0.89 (0.87, 0.91)
UK: Scotland	0.92 (0.91, 0.93)
Ireland	0.92 (0.91, 0.93)
Netherlands	0.93 (0.92, 0.93)
UK: Northern Ireland	0.93 (0.91, 0.95)
Sweden	0.93 (0.92, 0.94)
Belgium	0.94 (0.93, 0.95)
Poland	0.95 (0.94, 0.95)
Spain	0.97 (0.97, 0.98)
Slovenia	0.98 (0.96, 1.00)
France, Survey	0.98 (0.95, 1.01)
Cyprus	0.98 (0.95, 1.01)
Germany	0.98 (0.98, 0.99)
Finland	0.98 (0.97, 1.00)
Hungary	0.99 (0.98, 1.00)
Switzerland	0.99 (0.98, 1.00)
Malta	0.99 (0.95, 1.03)
Estonia	0.99 (0.96, 1.02)
Norway	1.00 (0.98, 1.01)
Greece	1.00 (0.99, 1.01)
Portugal	1.00 (0.99, 1.01)
Czech Republic	1.01 (1.00, 1.01)
Luxembourg	1.01 (0.97, 1.04)
Iceland	1.01 (0.96, 1.06)
Italy	1.01 (1.01, 1.02)
Austria	1.02 (1.01, 1.03)
Lithuania	1.02 (1.00, 1.04)
Denmark	1.02 (1.01, 1.03)
Slovakia	1.05 (1.04, 1.07)

Risk ratios with 95% confidence intervals

NOTE: Pooled random effects estimate: 0.98 (95% CI: 0.97-0.99).
I^2=98.2% Chi squared tests of heterogeneity: 1556.24 (d.f. = 28), p < 0.001.
First-period data not from 2010: Cyprus 2007.
Second-period data not from 2015: Bulgaria 2014, Poland 2014, Sweden 2014, Switzerland 2014.

R8 SMOKING DURING PREGNANCY

JUSTIFICATION

Maternal smoking is one of the most important preventable factors associated with adverse pregnancy outcome. Maternal smoking during pregnancy impairs normal fetal growth and development and is associated with low birth weight, fetal growth restriction, stillbirth, preterm birth, and some congenital anomalies.[1-3] Moreover, its influence on outcomes is not limited only to the perinatal period; increasing evidence suggests it also has lifelong consequences for the child, with elevated risks of childhood obesity, neurobehavioural and cognitive deficits, and impaired lung function, including wheezing and asthma.[4-7]

Smoking among pregnant women has declined in high-income countries, but it nonetheless continues to account for a substantial proportion of fetal and infant morbidity and mortality. Smoking before pregnancy and the likelihood of stopping smoking are associated with lower maternal educational level and poverty. Smoking thus contributes to the creation of social inequalities in perinatal health.[8,9]

Public health interventions exist to reduce smoking and to tackle social inequalities in tobacco use.[10] A preventive population approach is important to reduce the prevalence of smoking before pregnancy in the childbearing population. Furthermore, smoking cessation interventions have been shown to be effective in improving pregnancy outcomes[11] and can serve as an indicator of the quality of antenatal preventive healthcare services.

DEFINITION AND PRESENTATION OF INDICATOR

Smoking during pregnancy is defined as the proportion of women who smoked during pregnancy among those with live born or stillborn babies. When possible, data were collected for two time periods: an earlier (ideally, first trimester) and a later (ideally, third trimester) phase.

DATA SOURCES AND AVAILABILITY OF INDICATOR IN EUROPEAN COUNTRIES

The data were provided by 20 of 31 countries. Some countries, including France and the Netherlands, provided data based on routine surveys. It is striking, however, that this important indicator of perinatal health as well as of the effectiveness of preventive public health policies is not available in many countries.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THE INDICATOR

To be able to compare countries or regions or to evaluate time trends, a common time frame is essential. This is important because many women stop smoking during pregnancy. If a single measure is the most practical option, it should relate to the last trimester of pregnancy so that the length and timing of exposure can be taken into account. Many data sources include information on smoking in pregnancy, but without further clarification.

Differences in the type of data (antenatal care records, medical records in maternity units, and birth surveys including interviews with mothers before and after birth), as well as the questions asked are additional sources of potential bias. Accordingly, the quality of the information is variable. Some data sources may record a woman as a non-smoker if smoking is not recorded in medical records. The rate of missing data ranges from 0% (the Czech Republic, Latvia, Lithuania, Malta, and Slovenia) to 17% in Croatia, 19% in England, 25% in Austria, and 29% in Germany.

Finally, there is evidence that some women may under-report smoking, as they know that they should not be smoking during pregnancy. Misclassification and inaccurate estimates of smoking may thus result. Many of the data providers expressed reservations about the quality of these data because they were based on self-report, and missing data were not well recorded. Euro-Peristat does not collect information on amount smoked, so these data cover both women who smoked daily and those who smoked occasionally.

RESULTS

Table R8.1 presents information on the time periods covered by the data and the proportions of smokers during both periods. Eight countries provided information during pregnancy without clearly specifying the time period, 11 countries provided data for two periods (either before and during pregnancy or during the first and the second or third trimesters), 2 countries provided information on smoking prevalence early in pregnancy only. The prevalence of smoking in the second period (during pregnancy or in the last trimester) was between 5 and 8% in most countries providing data, but Norway, Sweden, and Lithuania reported prevalence rates below 5%, while more than 10% of pregnant women smoked in Valencia (18.3%), France (16.3%), Catalonia (13.0%), Austria (12.5%), the UK (between 12 and 17%), and Luxembourg (10.7%). When prevalence was available for two periods, the percentage of smokers was always lower closer to delivery.

Overall, in countries that provided data for 2010 and 2015, there were lower proportions of smokers during pregnancy in 2015, but in a few countries, prevalence was stable or rose slightly. Reductions of more than two percentage points were observed in Denmark, Estonia, Germany, Cyprus, Latvia, Luxembourg, Finland, and Norway. In Scotland, the data in 2015 relate to smoking at booking, whereas in 2010, the period was an unspecified moment during pregnancy. The pooled measure of change between 2010 and 2015 for all countries reflects the predominance of countries reporting decreases in smoking: 0.87 (95% confidence intervals: 0.79-0.95), but heterogeneity was highly significant.

KEY POINTS

- Not all countries could provide data on maternal smoking during pregnancy, and standardised collection procedures are necessary to improve comparability for those countries that did.
- In some European countries, more than 10% of women smoke during their pregnancy.
- Declines in maternal smoking during pregnancy were observed when recent data were compared with 2010, although there were differences in the magnitude of the decrease; policies should be reviewed in countries where smoking prevalence is high with only slight decreases.
- Given the adverse effects of smoking on fetal and infant health and since pregnancy care is considered an ideal setting for intervention, obtaining high quality and comparable information on smoking before and during pregnancy should be a priority.

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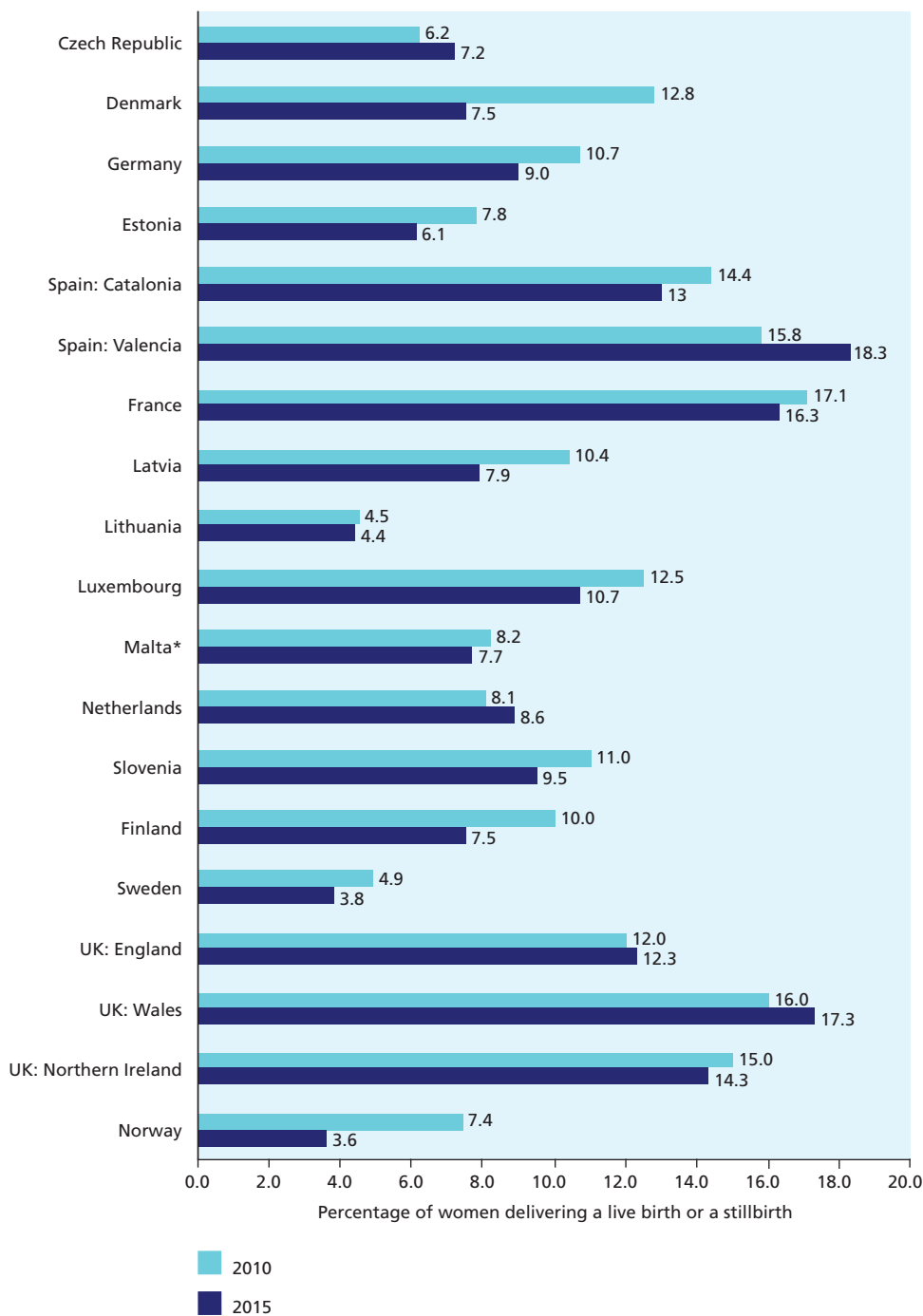## Table R8.1 Percentages of women who smoked during pregnancy in 2010 and comparisons with 2015

Country/coverage	Time period		Smokers in 2015		Smokers in 2010	Time period
	Period 1	Period 2	Period 1 %	Period 2 %	Latest period %	Latest period
Belgium						
Bulgaria						
Czech Republic		During pregnancy		7.2	6.2	during
Denmark	1st trimester	2nd trimester	11.0	7.5	12.8	during
Germany		During pregnancy		9.0	10.7	during
Estonia	1st trimester	During pregnancy	7.6	6.1	7.8	during
Ireland						
Greece						
Spain: Catalonia	Before pregnancy	3rd trimester	22.8	13.0	14.4	3rd trimester
Spain: Valencia		End of pregnancy		18.3	15.8	1st trimester
France	Before pregnancy	3rd trimester	29.8	16.3	17.1	3rd trimester
Croatia		During pregnancy		8.1		
Italy	Before pregnancy	During pregnancy	20.5	5.3		
Cyprus		During pregnancy		6.3	11.5	1st trimester
Latvia		During pregnancy		7.9	10.4	during
Lithuania	Before pregnancy	During pregnancy	8.0	4.4	4.5	during
Luxembourg	1st trimester	3rd trimester	13.3	10.7	12.5	3rd trimester
Hungary						
Malta	At booking		7.7		8.2	1st trimester
Netherlands		During pregnancy		8.6	8.1	after 1st trimester
Austria		3rd trimester		12.5		
Poland				N/A*	12.3	3rd trimester
Portugal						
Romania						
Slovenia		During pregnancy		9.5	11.0	during
Slovakia						
Finland	1st trimester	After 1st trimester	14.7	7.5	10.0	after 1st trimester
Sweden	1st trimester	3rd trimester	5.1	3.8	4.9	3rd trimester
United Kingdom				N/A	12.0	during
UK: England *	At booking	Delivery	14.2	12.3	12.0	during
UK: Wales*		3rd trimester		17.3	16.0	during
UK: Scotland	At booking		16.4		19.0	during
UK: Northern Ireland*		During pregnancy		14.3	15.0	during
Iceland						
Norway	First visit	End of pregnancy	5.5	3.6	7.4	3rd trimester
Switzerland						

NOTE: *N/A available in 2010, but no longer available in 2015.

** Data for England, Wales and Northern Ireland in 2010 came from the Infant Feeding Survey. This was not done in 2015, so the data source in all three countries has changed.

Second-period data not from 2015: Spain Valencia 2016, France Survey 2016, Croatia 2016, Italy 2013, UK England 2015-2016, UK Wales 2016, Sweden 2014.

Figure R8.1   Smoking during pregnancy in 2010 and and 2015

Country	2010	2015
Czech Republic	6.2	7.2
Denmark	12.8	7.5
Germany	10.7	9.0
Estonia	7.8	6.1
Spain: Catalonia	14.4	13
Spain: Valencia	15.8	18.3
France	17.1	16.3
Latvia	10.4	7.9
Lithuania	4.5	4.4
Luxembourg	12.5	10.7
Malta*	8.2	7.7
Netherlands	8.1	8.6
Slovenia	11.0	9.5
Finland	10.0	7.5
Sweden	4.9	3.8
UK: England	12.0	12.3
UK: Wales	16.0	17.3
UK: Northern Ireland	15.0	14.3
Norway	7.4	3.6

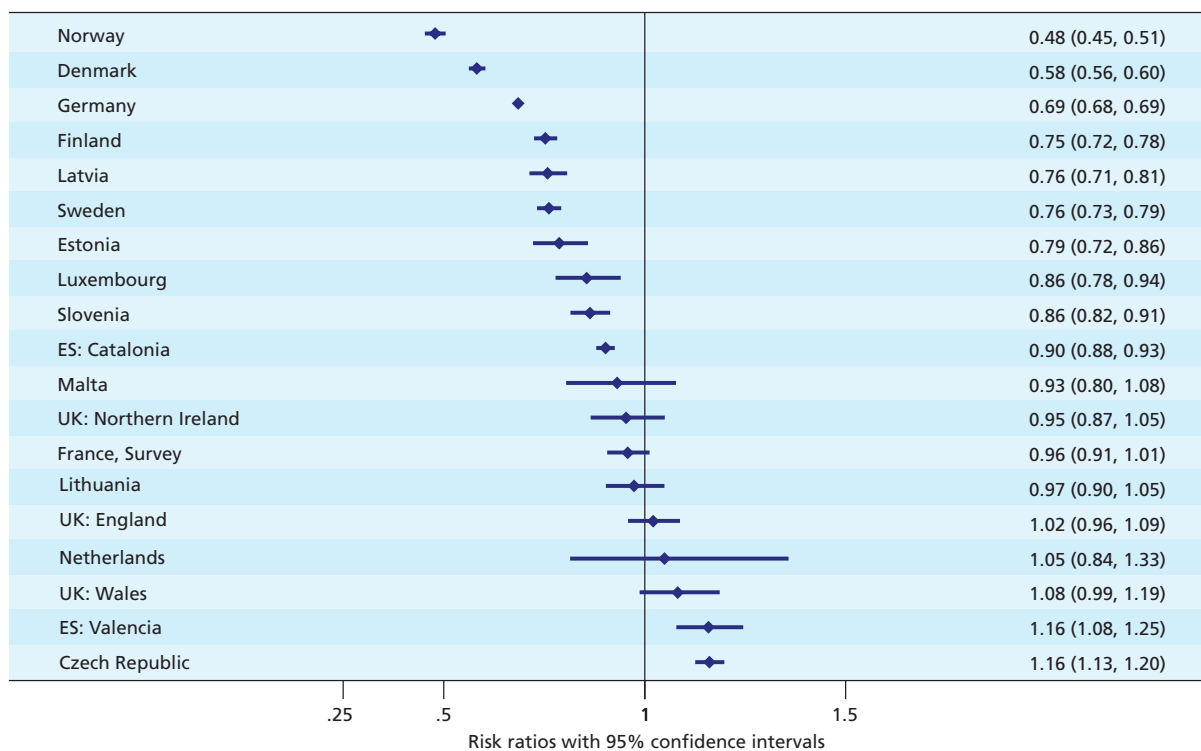Percentage of women delivering a live birth or a stillbirth

- 2010
- 2015

NOTE: * First trimester or at booking in 2010 and during pregnancy in 2015.
       ** At booking in 2015, during pregnancy in 2010.
       Second-period data not from 2015: Spain Valencia 2016, France Survey 2016, UK England 2015-2016, UK Wales 2016, Sweden 2014.

Figure R8.2   Comparison of smoking during pregnancy, 2010 and 2015 (risk ratios and 95% confidence intervals)

	Risk ratio (95% CI)
Norway	0.48 (0.45, 0.51)
Denmark	0.58 (0.56, 0.60)
Germany	0.69 (0.68, 0.69)
Finland	0.75 (0.72, 0.78)
Latvia	0.76 (0.71, 0.81)
Sweden	0.76 (0.73, 0.79)
Estonia	0.79 (0.72, 0.86)
Luxembourg	0.86 (0.78, 0.94)
Slovenia	0.86 (0.82, 0.91)
ES: Catalonia	0.90 (0.88, 0.93)
Malta	0.93 (0.80, 1.08)
UK: Northern Ireland	0.95 (0.87, 1.05)
France, Survey	0.96 (0.91, 1.01)
Lithuania	0.97 (0.90, 1.05)
UK: England	1.02 (0.96, 1.09)
Netherlands	1.05 (0.84, 1.33)
UK: Wales	1.08 (0.99, 1.19)
ES: Valencia	1.16 (1.08, 1.25)
Czech Republic	1.16 (1.13, 1.20)

Risk ratios with 95% confidence intervals

NOTE: Cyprus and Scotland not included because smoking was not recorded at the same period in both years.
Pooled random effects estimate: 0.87 (95% CI: 0.80-0.95).
I²=99.0% Chi squared tests of heterogeneity: 1856.56 (d.f. = 18), p<0.001.
Second-period data not from 2015: Spain Valencia 2016, France Survey 2016, UK: England 2015-2016, UK Wales 2016, Sweden 2014.

R12 DISTRIBUTION OF MATERNAL PREPREGNANCY BODY MASS INDEX

JUSTIFICATION

Promoting a healthy weight before pregnancy is one way to improve maternal and newborn health. Compared to women with normal weight before pregnancy, those who are overweight or obese, as well as those who are underweight, are at higher risk of adverse pregnancy outcomes.

The rising prevalence of overweight and obesity worldwide has important implications for pregnancy and childbirth. Prepregnancy overweight and obesity both increase the risks of pregnancy complications, such as gestational diabetes and preeclampsia. Perinatal and infant outcomes are less favourable, including higher rates of congenital anomalies, in particular, neural tube and congenital heart anomalies, stillbirth, fetal growth restriction, early preterm birth before 32 weeks of gestation, and macrosomia.[1-4] These risks explain in part why overweight and obese women are more likely to deliver by caesarean, but less effective uterine contractions also play a role.[5,6] Overweight and obesity affect maternal outcomes, and these women have higher rates of severe maternal morbidity and maternal death.[2] All these risks increase with the level of obesity. Research also suggests that obesity may affect the longer-term health of the child through fetal programming in utero, changes in the newborn's body composition, epigenetic processes, and changes in the gut microbiome.[7] Potential longer term health and developmental consequences include childhood and adult obesity, the metabolic illnesses associated with obesity, asthma, and neurodevelopmental delay.[4,7]

While much of the current focus of public health policy and practice is on overweight and obesity, being underweight also increases the risks of having a preterm or a low birthweight baby.[8] Both underweight and overweight are associated with lower socioeconomic status and thus create inequalities in health starting at birth.[9]

DEFINITION AND PRESENTATION OF INDICATOR

This indicator is defined as the percentage of women delivering live births or stillbirths by their prepregnancy body mass index (BMI) defined in accordance with WHO guidelines as follows: <18.5 (underweight), 18.5-24.9 (normal), ≥25.0 (overweight and obese).[10] Obese women can be subdivided as obese class I (BMI 30.0-34.9), obese class II (BMI 35.0-39.9), and obese class III (BMI ≥40.0).

DATA SOURCES AND AVAILABILITY OF INDICATOR IN EUROPEAN COUNTRIES

This indicator has limited availability in routine sources in Europe. It was provided by 12 of 31 countries. Poland was able to provide this indicator in 2010, but not in 2015.

METHODOLOGICAL ISSUES IN THE CALCULATION, REPORTING, AND INTERPRETATION OF THE INDICATOR

In most countries for which data are available, prepregnancy BMI is recorded at the first antenatal visit, which may slightly overestimate the mother's BMI before pregnancy. Weights recalled by women themselves, as for instance in France, tend to be slightly under-reported.[11] Some countries had high proportions of missing data for this indicator, with ranges from 0 to 20% or more (Malta, England, and Norway). In general, BMI was missing for around 10% of women.

Figure R12.1 shows that women with a low prepregnancy BMI accounted for 2.4 to 7.4% of mothers giving birth in countries for which data were available, with highs in France (7.4%) and Austria (6.4%) and lows in the UK, Malta, and Sweden (<3.0%). The proportion of overweight or obese women ranged from around 30% to 50% of all women, with prevalence less than 30% in Croatia, Austria and Slovenia and around 50% in the UK. Between 8 and 26% of all women were obese.

In comparison with the 2010 data in the last Euro-Peristat report, the proportions of obese women in 2015 increased slightly in most countries that provided data at both time points, as shown in Figure R12.2. The exceptions are Denmark, where the prevalence was stable, and Norway, where it decreased slightly. In interpreting data from Norway, it should be noted that BMI was recently added and proportions of missing data were high in both 2010 and 2015. Figure R12.3 shows risk ratios with 95% confidence intervals for the change in the prevalence of obesity among pregnant women between 2010 and 2015. The pooled risk ratio was positive and significant – 1.15 (95% confidence intervals: 1.08-1.22) with significant heterogeneity across countries.
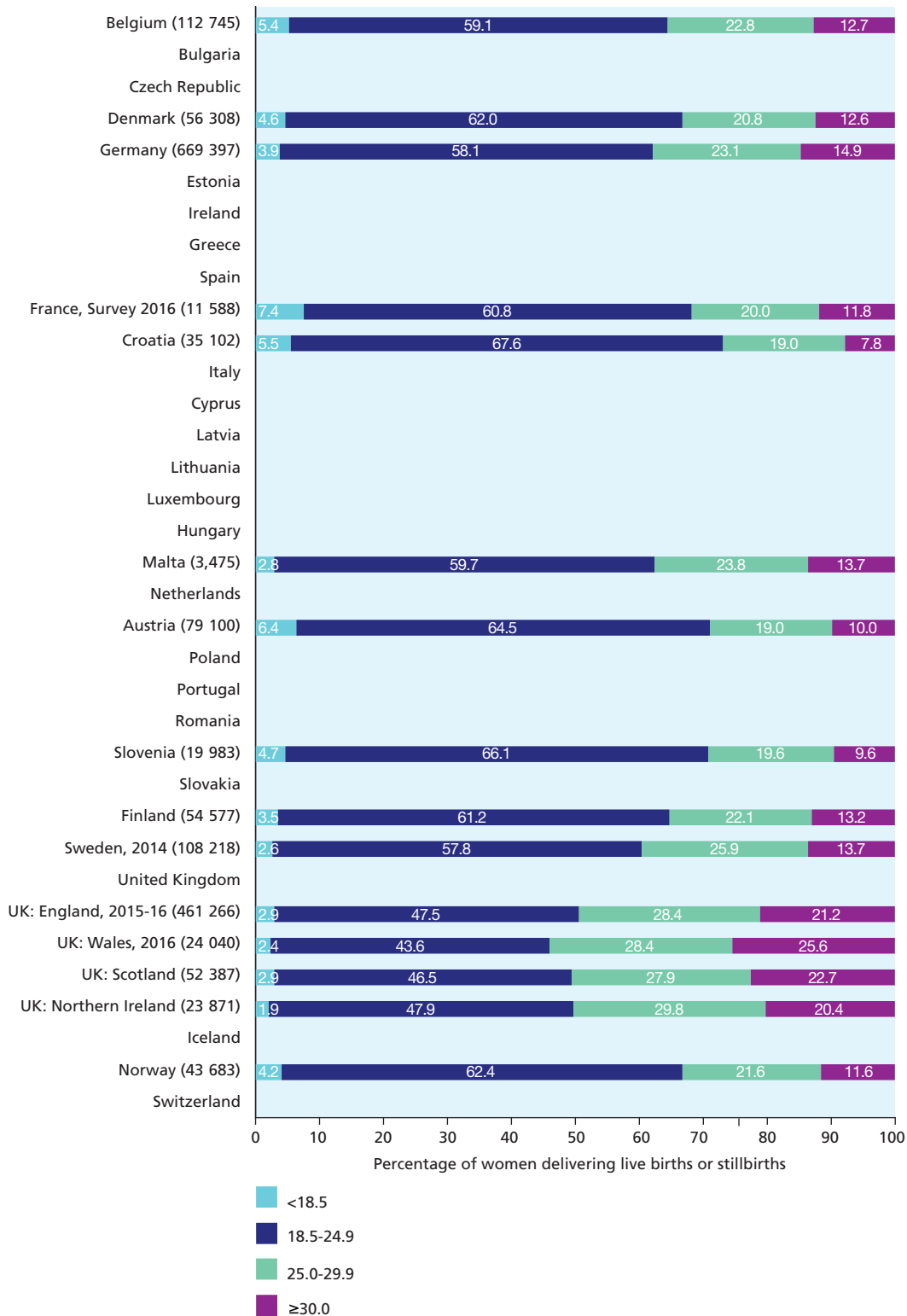
KEY POINTS

- Maternal weight before and during pregnancy affects the course of pregnancy, its outcome, and the offspring's lifelong health.
- Despite its importance for describing the risks facing childbearing women, this indicator is not available in most European countries.
- There is a high variation in the distribution of prepregnancy BMI, but in most countries reporting data, more than 10% of women were obese at the onset of pregnancy
- Adding information about women's prepregnancy BMI to routine surveillance systems for maternal and newborn health should be a priority in countries where these data are not available.
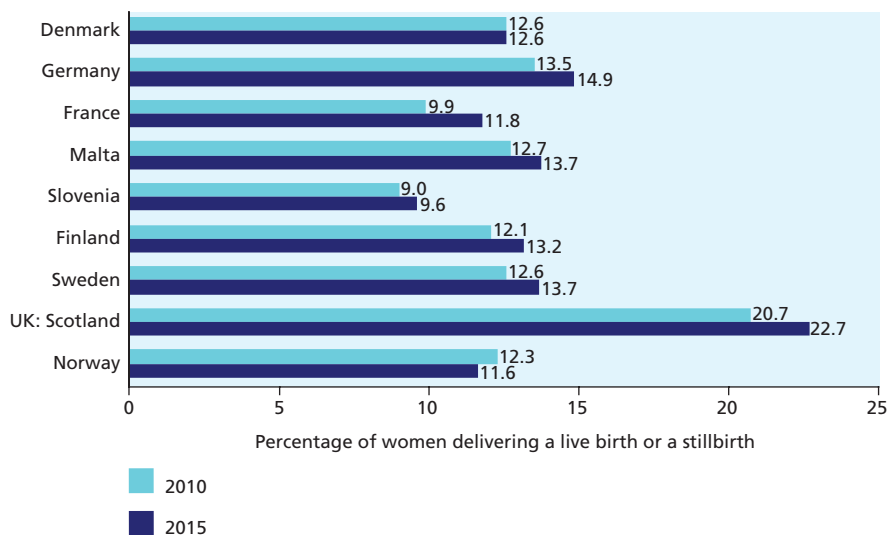
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Figure R12.1   Distribution of maternal prepregnancy body mass index

Country	<18.5	18.5-24.9	25.0-29.9	≥30.0
Belgium (112 745)	5.4	59.1	22.8	12.7
Bulgaria				
Czech Republic				
Denmark (56 308)	4.6	62.0	20.8	12.6
Germany (669 397)	3.9	58.1	23.1	14.9
Estonia				
Ireland				
Greece				
Spain				
France, Survey 2016 (11 588)	7.4	60.8	20.0	11.8
Croatia (35 102)	5.5	67.6	19.0	7.8
Italy				
Cyprus				
Latvia				
Lithuania				
Luxembourg				
Hungary				
Malta (3,475)	2.8	59.7	23.8	13.7
Netherlands				
Austria (79 100)	6.4	64.5	19.0	10.0
Poland				
Portugal				
Romania				
Slovenia (19 983)	4.7	66.1	19.6	9.6
Slovakia				
Finland (54 577)	3.5	61.2	22.1	13.2
Sweden, 2014 (108 218)	2.6	57.8	25.9	13.7
United Kingdom				
UK: England, 2015-16 (461 266)	2.9	47.5	28.4	21.2
UK: Wales, 2016 (24 040)	2.4	43.6	28.4	25.6
UK: Scotland (52 387)	2.9	46.5	27.9	22.7
UK: Northern Ireland (23 871)	1.9	47.9	29.8	20.4
Iceland				
Norway (43 683)	4.2	62.4	21.6	11.6
Switzerland				

Percentage of women delivering live births or stillbirths
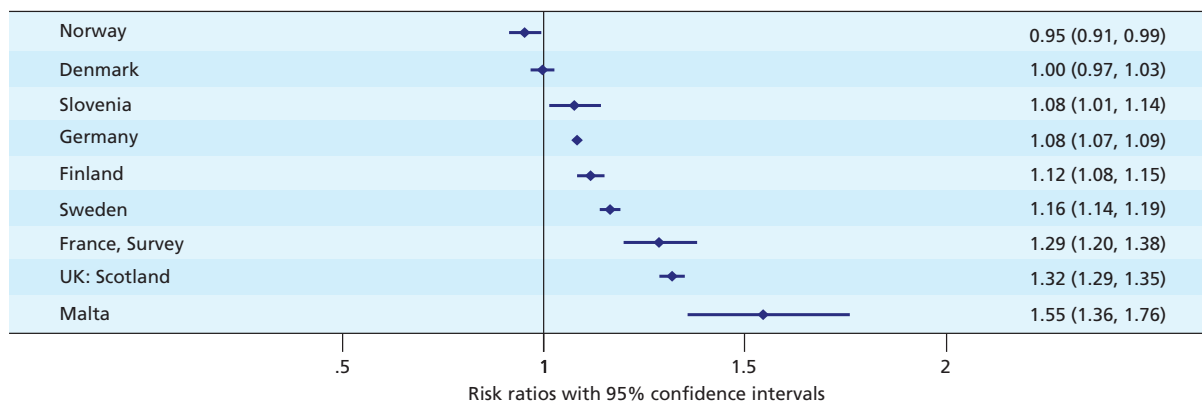
Legend:
- <18.5
- 18.5-24.9
- 25.0-29.9
- ≥30.0

Figure R12.2   Percentages of women with a prepregnancy body mass index ≥ 30 in 2010 and 2015

NOTE: Second-period data not from 2015: France Survey 2016.

Figure R12.3   Comparison of the percentages of women with a prepregnancy body mass index ≥ 30, 2010 and 2015 (risk ratios and 95% confidence intervals)

	Risk ratios with 95% confidence intervals
Norway	0.95 (0.91, 0.99)
Denmark	1.00 (0.97, 1.03)
Slovenia	1.08 (1.01, 1.14)
Germany	1.08 (1.07, 1.09)
Finland	1.12 (1.08, 1.15)
Sweden	1.16 (1.14, 1.19)
France, Survey	1.29 (1.20, 1.38)
UK: Scotland	1.32 (1.29, 1.35)
Malta	1.55 (1.36, 1.76)

NOTE: Pooled random effects estimate: 1.15 (95% CI: 1.08-1.22).
        I²=97.7% Chi squared tests of heterogeneity: 352.50 (d.f. = 8), p <0.001.
        Second-period data not from 2015: France Survey 2016.