Variations in very preterm births rates in 30 high-income countries: are valid international comparisons possible using routine data?

Short title: International comparisons of very preterm birth rates

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Abstract

Objective: Concerns about differences in registration practices across countries have limited the use of routine data for international very preterm birth rate (VPT) comparisons.

Design: Population-based study

Setting: 27 European countries, the United States, Canada and Japan in 2010.

Population: 9,376,252 singleton births.

Method: We requested aggregated gestational age data on live births, stillbirths and terminations of pregnancy (TOP) under 32 weeks, and information on registration practices for these births. We compared VPT rates and assessed the impact of births at 22-23 weeks GA, and different criteria for inclusion of stillbirths and TOP on country rates and rankings.

Main outcome measures: Singleton very preterm birth rate, defined as all singleton stillbirths and live births before 32 completed weeks of gestation per 1000 total births, excluding TOP if identifiable in the data source.

Results: Rates varied from 5.7 to 15.7 per 1000 total births and 4.0 to 11.9 per 1000 live births. Periviable births (22-23 weeks) represented between 1% and 23% of VPT births and stillbirths represented between 10% and 100% of periviable births. After exclusion of these births, rate variations remained high and with a few notable exceptions, country rankings were unchanged.

Conclusions: International comparisons of very preterm birth rates using routine data should exclude births at 22-23 weeks GA and terminations of pregnancy. The persistent large variations in VPT rates after these exclusions call for continued surveillance of VPT birth rates at 24 weeks and over in high income countries.

Key words: very preterm births, Euro-Peristat, stillbirths, international comparisons, preterm birth

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Tweetable abstract: International comparisons of very preterm birth rates using routine data should exclude births at 22-23 weeks GA and terminations of pregnancy.

Introduction

Preterm birth, defined as a birth before 37 completed weeks of gestation, is a leading cause of neonatal and infant mortality globally, representing about 75% of all neonatal deaths and 60% of all infant deaths [1, 2]. Infants born very preterm (before 32 completed weeks) face the highest risks of neonatal mortality and morbidity, as well as long-term neurodevelopmental impairment [3-6]. Recent studies showed wide variations in total preterm births among countries with comparable levels of development and healthcare systems, raising questions about the population and health system factors that influence preterm birth [1, 7-9]. However, less is known about international variation in rates and trends in very preterm (VPT) birth, which represents the most vulnerable infants.

There are concerns about using routine statistics for international comparisons at very early gestational ages because of differences in recording practices across countries [10-15]; especially regarding rules for registering stillbirths and late terminations of pregnancy (TOP) [14, 15]. Further, differences between countries in views on viability can influence whether births with signs of life that occur at 22 and 23 weeks of GA are actually registered as live births or stillbirths [16]. Differences in recording practices have been shown to have a strong impact on international comparisons of perinatal mortality [10-15]. Thus, while the World Health Organization (WHO) defines the perinatal period as starting at 22 completed weeks (154 days) of gestation, they recommend restricting international comparisons of perinatal mortality to third-trimester births, defined using a 1000 gram lower threshold [17]. Others have used 28 weeks of gestation as a cut-off for comparative studies [14]. These cutoffs are not useful for comparisons of VPT birth rates since many births occur before 28 weeks and/or with birth weights less than 1000 grams, and the majority of these infants now survive in high-income countries [4].

Given the impact of very preterm births on the overall perinatal mortality rate, the high costs of care for these infants [18, 19, 6], and their vulnerability to long-term neurodevelopmental impairments, producing comparable and regularly reported statistics on this population is an important objective. Our study aimed to assess the feasibility of using routine statistics to make valid international comparisons of VPT birth rates. We used routine population-based data in 2010 in 27 European countries, the United States, Canada and Japan to describe very preterm birth rates and investigate the extent to which births at very early gestations (22-23 weeks), stillbirths, and TOP affect rate variations.

Methods

Data

This study is part of an international collaboration between the Euro-Peristat network and the Preterm Birth International Collaborative (PREBIC) Epidemiology Working Group. Euro-Peristat is a European Union-funded network of clinicians, statisticians and researchers that aims to monitor perinatal health in Europe based on a recommended set of 30 perinatal health indicators [20]. These indicators are compiled from population-based routine data sources; routine sources are defined as those that regularly collect and report data and can include repeated surveys. European data in this study were originally collected for the *European Perinatal Health Report: the Health and care of pregnant women and babies in 2010* [1]. Data from the United States, Canada and Japan were provided specifically for this study by members of the PREBIC Epidemiology Working group. PREBIC is a multi-disciplinary network of scientific experts focused on the prevention of preterm birth through basic, epidemiologic, and applied clinical research.

We requested aggregate national-level data on the number of live births and fetal deaths at each completed week of gestation by plurality (singleton or multiple) starting at 22 weeks in 2010. We also asked for separate data on TOP, when these were included in the data sources and could be differentiated from spontaneous stillbirths. When gestational age was missing, we asked countries to include births if birth weight was 500 grams or more. The 22-week GA threshold is recommended by Euro-Peristat for the collection of all data on births in Europe [20]. If countries could not provide data using these criteria, they were asked to provide available data using their own inclusion criteria, and to specify their inclusion thresholds for live births and stillbirths.

Data came from vital statistics, civil registers and medical birth registers in most countries and from nationally representative surveys of births in Cyprus and in France [1]. If countries could not provide national data, population-based data from geographically defined regions were accepted. Data for Belgium (BE) came from the regions of Brussels, Wallonia and Flanders; data from the United Kingdom were provided separately by the UK's constituent countries: England and Wales combined, Northern Ireland, and Scotland. Data from Cyprus were from 2007 and data from Canada were from 2008. Data from Canada included all provinces and territories except the province of Ontario. Euro-Peristat also collects information on data quality, management, and data collection procedures [15]. The sources of data used for each of the countries and their coverage are provided in Supplemental Table S1.

Outcome

Our principal outcome was the singleton very preterm birth rate, defined as all singleton stillbirths and live births before 32 completed weeks of gestation per 1000 total births, excluding TOP if identifiable in the data source. We also computed the singleton VPT live birth rate (number of singleton live VPT births per 1000 live births). We limited our comparison to singleton pregnancies, because preterm birth rates are much higher for multiple pregnancies and multiple pregnancy rates differ widely among countries [9, 21]. In the European countries, Canada and Japan, gestational age was based on the best obstetrical estimate. This estimate can be derived from ultrasound, and other prenatal assessments of gestational length (i.e. last menstrual period, fundal height). In Canada, postnatal assessments may sometimes be used if ultrasound data are missing. In the United States (US), the obstetric estimate of gestational age was used in the 35 states which had adopted the 2003 birth certificate revision; however, 15 states used the 1989 revision which relies on the clinical estimate of gestational age, and is based on postnatal assessment in addition to ultrasound and prenatal assessments [22, 23]. In the US, birth and death data are linked from separate data sources. Out of the 35 states which had adopted the 2003 revision for live birth certification only 25 had adopted the 2003 revision for fetal death certification, whilst other states reported only the 1989 revision [24]. In our study, less than 1% of gestational age data were missing, except in Spain, where 14% were missing.

Analysis strategy

For the analyses, we identified countries where differences in registration practices may contribute to variability in rates. First, we assessed whether the data provided by each country met our inclusion criteria: births and deaths starting at 22 weeks of gestation for each completed week of gestation, excluding terminations. We identified countries using different birth weight or gestational age criteria, as well as countries that included TOP in their vital statistics but could not distinguish them from spontaneous births. Next, we calculated the rates of singleton VPT birth for all births at less than 32 weeks GA per 1000 using a lower threshold of 22 weeks GA or national definitions. We then evaluated the influence of periviable births (defined as births at 22-23 weeks) and stillbirths on country rates and rankings by comparing VPT birth rates with and without these births. We also calculated periviable births as a percent of singleton VPT births, and stillbirths as a percent of singleton VPT births (for births ≥22 weeks GA vs. ≥ 24 weeks GA) and by gestational age subgroups: at 22-23 weeks GA, 24-27 weeks GA, and 28-31 weeks GA. We studied the association between rates for total and live births overall and by gestational age subgroups using Spearman's rank test. Last, we investigated the potential impact of underreporting of stillbirths, even after exclusion of births at 22 to 23 weeks, by simulating an extreme situation

where a third of stillbirths 24 to 27 weeks of GA were not reported in countries with higher registration thresholds. Data were analyzed using STATA 13.0 software (StataCorp LP, College Station, TX, USA).

Results

Thirty countries provided data on 9,376,252 singleton births, of which 9,339,331 were live births and 36, 921 were stillbirths. All countries could provide data on singleton live births starting at 22 weeks of gestation, but several countries record stillbirths only starting at 24 weeks of GA or use a 500 gram birth weight threshold, as detailed in Table 1. Most countries could also provide data without TOP, either because they are not included in birth registers or because they can be distinguished from other deaths. However, Belgium, Cyprus, the Czech Republic, Iceland, Luxembourg, the Netherlands, Slovenia, Spain, UK: England and Wales, and UK: Northern Ireland could not exclude TOP from their statistics. The median rate of singleton VPT birth among participating countries was 9.5 per 1000 births. Countries with the lowest rates, that is, below the 25th percentile (Q1= 8.5‰) included Iceland, Finland, Japan, Sweden, Italy, Slovakia, Norway, Malta. Countries with the highest rates, above the 75th percentile (Q3=10.8‰) included Germany, UK: England and Wales, UK: Scotland, the Netherlands, Romania, Latvia, the United States and BE: Brussels (Table 1).

Figure 1 illustrates the variations in births at 22-23 weeks as a proportion of all VPT singleton births; the associated registration practices for births and deaths in each country are also shown. The unweighted mean for the 30 countries (9.6%) is presented here with 95% upper and lower confidence limits. The percentage of periviable births varied between 0.7% and 23.4% across countries, and 18 out of 30 countries/regions had proportions of births at 22-23 weeks GA outside the 95% confidence limits. Countries with a 24-week GA threshold for registration of stillbirths, voluntary reporting of stillbirths at certain gestational ages, or those using a 500 grams threshold for stillbirth reporting, had lower proportions of these very early births: Romania (0.7%), Portugal (1.5%), Spain (3.5%), Italy(4.3%), UK: England and Wales (5.0%), Ireland (6.3%), UK: Scotland (6.9%), and Germany (8.3%). However other countries with a 22-week threshold also had low rates, notably, Slovakia (2.2%), and Latvia (4.0%). Countries that were unable to remove TOP had higher proportions of births at 22-23 weeks GA, including BE: Brussels (15.7%), the Czech Republic (23.3%), and the Netherlands (23.4%). Nonetheless, others where data included only spontaneous stillbirths also had high rates such as Japan (11.5%), Denmark (12.4%), the United States (13.7%), Switzerland (14.0%), and Canada (14.4%).

Stillbirths constituted an average 20.6% of all very preterm births for the 30 countries, with a range between 5.9% and 39.9%, as shown in Figure 2A. Seventeen countries/regions displayed percentages of

stillbirths outside the upper and lower confidence limits based on the average in 30 countries. Romania (5.9%), Slovakia (7.2%), Spain (8.7%), Italy (9.1%), Germany (13.3%), Portugal (15.5%), the United States (16.5%), Austria (17.0%), UK: England and Wales (17.3%), Poland (18.5%) had particularly low percentages of stillbirth, whereas Japan (22.4%), Belgium (Flanders 26.7%, Wallonia 27.3%, Brussels 36.2%), the Netherlands (28.2%), the Czech Republic (31.8%) and France (39.9%) had high percentages. Some of the countries with the lowest rates had other inclusion criteria, and those with the highest VPT rates could not exclude terminations. However, even in countries with similar registration practices, there were wide differences in the percentage of stillbirths among VPT births. There was substantially less variation around the mean after excluding births at 22-23 weeks GA (Figure 2B) although, percentages still ranged between 6.0% and 29.6%

The median percentage of stillbirths was 58.8% at 22-23 weeks GA, 24.8% at 24-27 weeks and 10.6% at 28-31 weeks. Variation was particularly high at 22-23 weeks ranging from 10.4% in Italy to 100% in Iceland and Cyprus; Iceland and France stood out as outliers based on the overall distribution of stillbirths at 28-31 weeks GA (Supplemental Figure S1). Median rates of births at 22-23 weeks were 0.9 per 1000 for all births versus 0.3 per 1000 for live births; at 24-27 weeks GA, 2.8 per 1000 for all births versus 2.1 per 1000 for live births and at 28-31 weeks GA, 5.5 per 1000 for all births versus 4.9 per 1000 for live births (Supplemental Figure S2).

In general, countries with high rates in one gestational age category were more likely to have higher rates in the others, with the exception of the 22-23-weeks category. For live birth rates at 22-23 weeks GA and 24-27 weeks GA, the rank correlation coefficient was 0.37 ($p=0.02$), but for births at 22-23 weeks GA and births at 28-31 weeks it was 0.1 ($p=0.77$). The correlation was strongest (0.53) for birth rates at 24-27 weeks GA and 28-31 weeks GA ($p<0.01$). The correlation between gestational age-specific rates based on all births and live births was 0.43 ($p=0.01$) for births at 22-23 weeks GA, 0.82 ($p<0.01$) for births at 24-27 weeks GA, and 0.94 ($p<0.01$) for births at 28-31 weeks GA.

In Table 2, we compare countries' very preterm birth rates and rankings using different gestational age criteria (22+ versus 24+ weeks GA) for all births and live births. Overall, rates of all VPT births from 24 to 31 weeks ranged from lower values of 5 to upper values of 13 per 1000, whereas for live births the range was from 4 to 11 per 1000. In general, countries with high rates for all births remained high when births at 22-23 weeks GA and stillbirths were excluded, and those with lower rates remained low. Rates were strongly correlated: the correlation coefficient for rates based on all VPT births 22+ weeks GA and live births 24+ weeks was 0.78

($p<0.01$); for live and total VPT births at 24-31 weeks GA, the correlation coefficient was 0.92 ($p<0.01$). Countries in the higher and lower quartiles of the distribution regardless of the definition remained the same, with a few exceptions (Italy is ranked lower while France had a better ranking when stillbirths were removed). Furthermore, our sensitivity analysis based on an extreme situation (one third underreporting of stillbirths at 24-27 weeks) in countries that do not record stillbirths starting at 22 weeks, showed that rates and rankings were robust to potential residual underreporting (Supplemental Table S2).

Discussion

Main findings:

Very preterm birth rates varied widely across Europe, North America and Japan. Our analyses by gestational age subgroups and vital status at birth suggest that rates are affected by differences in the recording of VPT births and deaths, including lower gestational age and birthweight thresholds for recording stillbirths and registration rules and the capacity for identifying TOP; thus we recommend excluding births at 22 and 23 weeks GA and terminations of pregnancy for valid international comparisons of very preterm birth rates. However, our study illustrates the very large variation between countries, even after exclusion of periviable births and stillbirths and between countries that fulfilled inclusion criteria. Rankings before and after excluding periviable births and stillbirths were similar and robust to the potential effects of stillbirth under-reporting. Two indicators: births at 22-23 weeks and stillbirths as percentages of all VPT births, made it possible to flag countries where recording practices may require further assessment.

Strengths and limitations:

We had access to population-based data provided for each completed week of gestation and plurality compiled using a common protocol [1]. Countries with varying gestational age or birth weight thresholds for recording stillbirth were identified. We were also able to exclude TOP in countries where they are included in birth registries and identifiable, and to flag countries where TOP were included and could not be removed. However, there were several limitations. We requested data using the best obstetric estimate of gestational age, but did not have further information on how this estimate was derived. While ultrasound dating is the norm, various methods of gestational age assignment are likely used and may impact the estimates of the preterm birth rate [25, 26]. We also only had data from one year, which leads to random variation in countries with a small number of annual births. Finally since our data were aggregated, we were unable to stratify by other factors that may affect the preterm birth rates such as maternal age, parity, and socioeconomic status.

Interpretation

Our results suggest an association between registration practices and VPT birth rates and rankings. Many countries with very low proportions of births 22-23 weeks were also those that used a registration criterion for stillbirths other than 22 weeks GA. Most countries register live births based on any sign of life, although practical and ethical difficulties can arise when assessing signs of life at the earliest gestational ages [27-29]. Regulations for stillbirths can differ across countries (i.e. parental leave allowance), and reporting may also differ based on the intent of sparing parents the burden of having to report the death, or alternatively, feeling that parents would benefit from acknowledging that they had a baby which lived. These difficulties contribute to the wide variability in the proportion of births at 22 and 23 weeks registered as live versus stillbirth. The underreporting of stillbirth also has a strong impact on proportions of periviable births, since a large fraction of births at 22-23 weeks are stillbirths.

More generally, variations in the registration of stillbirths have an impact on VPT birth rates, owing to the high proportion of stillbirths before 32 weeks GA. Moreover, some of the countries with high proportions of very preterm stillbirths were unable to remove TOP inflating overall proportions. Antenatal screening practices and termination policies vary widely among countries [30-32], and the prevalence of late TOP depends on those policies. In some countries, terminations are not legal meaning that births for lethal anomalies are registered as stillbirths or neonatal deaths. The impact of TOP can affect some countries more than others such as the Netherlands and Belgium. In England and Wales, terminations could not be distinguished from stillbirth statistics although a previous English study showed that late TOP for congenital anomalies represent a relatively large proportion (17.1%) of births 22-26 weeks GA [33]. In Canada, there is some ambiguity between coding of TOP or congenital anomalies as the cause of death, which means that terminations are only excluded if recorded as the cause; other countries may also face this problem.

Our analyses show the importance of carrying out analyses of VPT birth rates after excluding periviable births and TOP. Although there are very wide differences in reporting practices for deaths, most countries can provide data on stillbirths starting at 24 weeks. This indicator is less sensitive to differences in the declaration of early neonatal deaths than at a 22-week threshold. This is consistent with results from previous studies about the impact of stillbirths and registration of births under 24 weeks on international mortality rate comparisons [14, 11, 16, 34-36]. As about 90% of live births will be at least 500 g at 24 weeks GA [37], the criteria of 24 weeks also facilitates comparisons with countries using a 500-g inclusion threshold for births and deaths. Including

spontaneous stillbirths in these comparisons is necessary to capture the global burden of morbidity and mortality associated with VPT birth, and rates for all births and live births starting at 24 weeks correlated very strongly.

Not all of the variation between countries can be accounted for by differences in reporting. Two-fold differences were observed among countries with low (Iceland, Finland) versus high (the US, Romania) live VPT birth rates at 24 weeks and over, which is the rate least susceptible to reporting differences. Also, rankings after removing periviable births and stillbirths were similar as shown by the high rank correlations and the associations between gestational-age specific subgroup rates at 24 weeks and over (Table S2). Furthermore, even if there were considerable underreporting of stillbirths in countries that do not record stillbirths starting at 22 weeks of GA we showed that this was unlikely to affect rates or rankings. Differences in maternal risk profiles could explain true differences in underlying VPT birth risks. The latest European Perinatal Health Report showed cross-country variations in maternal characteristics typically associated with preterm delivery rates, including age, smoking, pre-pregnancy body mass index and education [1, 38]. However, studies comparing the US with Canada and the US with France have shown that variations in risk of preterm delivery persisted even after adjustment for these socio-demographic characteristics [39, 40]. Differences in health systems factors may be another explanation for the observed heterogeneity; up to 46% of VPT singleton births result from a provider-initiated delivery [41].

Conclusions and recommendations

Our study answers the question posed in the title – whether valid international comparisons are possible using routine data – with a qualified yes. We demonstrated the importance of adopting a standardized approach to these comparisons by excluding births at 22 and 23 weeks GA and TOP and also provided indicators to flag countries with less reliable data at early gestational ages. However, we also found wide differences in rates among countries with similar inclusion criteria and complete coverage of all births. Differences in these rates have wide-reaching implications for public health. Besides their impact on national perinatal mortality rates [34, 42, 43], the health and financial burden of neurodevelopmental impairment is very high among VPT survivors [18, 19, 3, 6]. Medical advances have improved outcomes for these infants but, preterm birth prevention, defined as effective medical interventions supported by policy initiatives has thus far been a failure [44, 45]. The wide range of VPT birth rates observed in countries with similar levels of development suggests that potentially modifiable population or health care factors and practices, such as induced preterm birth, merit further study. Regularly reported international data on VPT births are needed to provide country-specific benchmarks for

232 preterm birth prevention initiatives, to inform decision-making and to target future investments in health care

233 and research [46, 47].

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Table 1. Singleton very preterm birth rates in 30 countries in 2010 and associated reporting criteria for births and deaths

Reporting criteria for stillbirths[2]	Country	Total births N	Very preterm births N	Rate per 1000 total births[1]	[95% CI]
	Canada[3]	229 700	2185	9.5	[9.1;9.9]
	Denmark	60 896	556	9.1	[8.4;9.9]
≥ 22 weeks, no TOP	Estonia	15 412	154	10.0	[8.4;11.6]
	Finland	59 484	397	6.7	[6.0;7.3]
	France	14 402	138	9.6	[8.0;11.2]
	Japan	1 083 473	8236	7.6	[7.4;7.8]
	Latvia	18 764	225	12.0	[10.4;13.6]
	Lithuania	30 167	272	9.0	[7.9;10.1]
	Malta	3872	32	8.3	[5.4;11.1]
	Malta	3872	32	8.3	[5.4;11.1]
	Norway	60 836	502	8.3	[7.5;9.0]
	Slovakia	54 204	447	8.2	[7.5;9.0]
	Sweden	111 705	860	7.7	[7.2;8.2]
	Switzerland	77 266	656	8.5	[7.8;9.1]
	United States	3 873 943	54 779	14.1	[14.0;14.3]
≥ 22 weeks, with TOP	BE: Brussels	23 933	376	15.7	[14.1;17.3]
	BE: Flanders	67 330	625	9.3	[8.6;10.0]
	BE: Wallonia	37 133	333	9.0	[8.0;9.9]
	Cyprus[3]	8133	83	10.2	[8;12.4]
	Czech Republic	112 116	1140	10.2	[9.6;10.8]
	Iceland	4765	27	5.7	[3.5;7.8]
	Luxembourg	6321	64	10.1	[7.6;12.6]
	Netherlands	172 707	1978	11.5	[10.9;12.0]
≥ 24 weeks, no TOP	Austria	76 226	820	10.8	[10.0;11.5]
	Romania	209 120	2397	11.5	[11.0;11.9]
	Portugal	98 690	870	8.8	[8.2;9.4]
	Slovakia	54 204	447	8.2	[7.5;9.0]
	Sweden	111 705	860	7.7	[7.2;8.2]
	UK: Scotland[4]	55 654	619	11.1	[10.2;12.0]
≥ 24 weeks, with TOP	UK: England and Wales[2]	699 494	7710	11.0	[10.8;11.3]
	UK: Northern Ireland	24 900	245	9.8	[8.6;11.1]
180 days, no TOP	Italy[4]	529 182	4254	8.0	[7.8;8.3]
180 days, with TOP	Spain[4]	444 217	4438	10.0	[9.7;10.3]
+500g or ≥ 24 weeks, no TOP	Ireland	73 041	635	8.7	[8.0;9.4]
+500g, no TOP	Austria	76 226	820	10.8	[10.0;11.5]
	Germany	613 796	6696	10.9	[10.6;11.2]
	Poland	403 781	3816	9.5	[9.2;9.8]
+500g, with TOP	Slovenia	21 589	228	10.6	[9.2;11.9]
Total births (N)		9 376 252	106 793		
Median rate (%)				9.5	[8.9;10.2]
[IQR]				8.5;10.8	
Range				5.7;15.7	

NOTE: (1) Using lower threshold of 22 weeks GA for births and deaths without TOP, or national definitions as specified. (2) All countries could provide data on live births starting at 22 weeks GA (3) Data from Cyprus are from 2007, data from Canada are from 2008. (4) Incomplete registration for stillbirths before 180 days in Spain and Italy, and before 24+ weeks in UK: Scotland.

Table 2. Country rankings of singleton very preterm birth rates in 2010 using different gestational age and vital status criteria

Rates per 1000 births Green = countries with the lowest rates; Red= countries with the highest rate for the reference group					
Total 22-31 weeks GA[1]		**Total 24-31 weeks GA reference group**		**Live 24-31 weeks GA**	
Country	**Rate**	**Country**	**Rate**	**Country**	**Rate**
Iceland	**5.7**	**Iceland**	**5.2**	**Iceland**	**4.0**
Finland	**6.7**	**Finland**	**6.1**	**Finland**	**5.2**
Japan	**7.6**	**Japan**	**6.7**	**Japan**	**5.6**
Sweden	**7.7**	**Sweden**	**7.0**	France	5.7
Italy	**8.0[3]**	**Malta**	**7.2**	**Malta**	**5.7**
Slovakia	8.2	**Switzerland**	**7.3**	**Sweden**	**6.0**
Norway	**8.3**	**Norway**	**7.5**	Luxembourg	6.0
Malta	**8.3**	**Italy**	**7.7[3]**	**Switzerland**	**6.2**
Switzerland	**8.5**	Czech Republic	7.8	BE: Wallonia	6.4[2]
Ireland	8.7	Denmark	8.0	**Norway**	**6.6**
Portugal	8.8	France	8.0	BE: Flanders	6.7[2]
BE: Wallonia	9.0[2]	Slovakia	8.1	Czech Republic	6.8
Lithuania	9.0	BE: Wallonia	8.1[2]	Ireland	6.8
Denmark	9.1	Ireland	8.2	Lithuania	6.9
BE: Flanders	9.3[2]	Canada (2008)	8.2	Canada (2008)	7.0
Poland	9.5	BE: Flanders	8.3[2]	Denmark	7.0
Canada (2008)	9.5	Lithuania	8.3	**Italy**	**7.0[3]**
France	9.6	Poland	8.5	Slovenia	7.2
UK: Northern Ireland	9.8[2]	Luxembourg	8.6	Poland	7.3
Spain	10.0[3]	Portugal	8.7	Netherlands	7.3
Estonia	10.0	Netherlands	8.8	Portugal	7.4
Luxembourg	10.1	Estonia	9.2	Slovakia	7.5
Czech Republic	10.2	UK: Northern Ireland	9.3[2]	UK: Northern Ireland	7.9[2]
Cyprus (2007)	**10.2**	Slovenia	9.5	Estonia	8.2
Slovenia	10.6	Austria	9.6	**UK: Scotland**	**8.3[2]**
Austria	10.8	Spain	9.6[3]	Austria	8.5
Germany	**10.9**	**Cyprus (2007)**	**9.8**	**UK: England and Wales**	**8.6[2]**
UK: England and Wales	**11.0[2]**	**Germany**	**10.0**	**Cyprus (2007)**	**8.3[2]**
UK: Scotland	**11.1[2]**	**UK: Scotland**	**10.4[2]**	Spain	8.9[3]
Netherlands	11.5	**UK: England and Wales**	**10.5[2]**	**Germany**	**8.9**
Romania	**11.5**	**Romania**	**11.4**	**Latvia**	**9.4**
Latvia	**12.0**	**Latvia**	**11.5**	**BE: Brussels**	**10.0[2]**
United States	**14.1**	**United States**	**12.2**	**Romania**	**10.7**
BE: Brussels	**15.7[2]**	**BE: Brussels**	**13.3[2]**	**United States**	**10.8**

NOTE: (1) Using lower threshold of 22 weeks GA, no TOP or national definitions (2) Data for Belgium and the UK provided by the region/constituent country (3) Incomplete registration before 180 days in Spain and Italy.