

Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

*eTable 1. Baseline Characteristics by Gestational Age Categories in 4 Nordic Countries**

Characteristic		Categories of gestation (weeks)					
		23-33	34-36	37-38	39-41	42-44	Overall
Norway							
Birth year	<=1985	10,331 (41.3)	37,035 (47.8)	121,612 (47.6)	694,475 (53.3)	142,766 (57.0)	1,006,219 (52.7)
	>1985	14,680 (58.7)	40,501 (52.2)	133,661 (52.4)	607,508 (46.7)	107,796 (43.0)	904,146 (47.3)
Sex	Male	13,625 (54.5)	42,509 (54.8)	138,425 (54.2)	660,257 (50.7)	125,285 (50.0)	980,101 (51.3)
Birth weight	(gram)	1780 (1390,2160)	2728 (2380,3120)	3240 (2930,3560)	3600 (3290,3915)	3730 (3400,4060)	3540 (3200,3880)
	(SD)	-0.78 (-1.79, 0.35)	-0.13 (-1.14, 1.05)	0.00 (-0.83, 0.87)	-0.14 (-0.88, 0.62)	-0.65 (-1.39, 0.12)	-0.19 (-0.97, 0.60)
Maternal age	<=24	8,154 (32.6)	26,661 (34.4)	79,884 (31.3)	435,922 (33.5)	100,384 (40.1)	651,005 (34.1)
	25-29	8,019 (32.1)	24,798 (32.0)	85,024 (33.3)	463,238 (35.6)	86,739 (34.6)	667,818 (35.0)
	30-35	6,551 (26.2)	19,256 (24.8)	67,270 (26.4)	316,236 (24.3)	51,017 (20.4)	460,330 (24.1)
	>=36	2,287 (9.1)	6,821 (8.8)	23,095 (9.0)	86,587 (6.7)	12,422 (5.0)	131,212 (6.9)
Previous births	0	12,512 (50.4)	36,367 (47.3)	101,398 (40.0)	517,436 (40.0)	116,876 (46.9)	784,589 (41.4)
	>=1	12,323 (49.6)	40,575 (52.7)	151,910 (60.0)	775,574 (60.0)	132,177 (53.1)	1,112,559 (58.6)
Sweden							
Birth year	<=1985	11,107 (31.4)	44,565 (37.7)	179,468 (36.5)	744,334 (39.6)	114,952 (49.5)	1,094,426 (39.7)
	>1985	24,237 (68.6)	73,580 (62.3)	312,192 (63.5)	1,137,454 (60.4)	117,317 (50.5)	1,664,780 (60.3)
Sex	Male	19,254 (54.5)	63,803 (54.0)	254,393 (51.7)	955,819 (50.8)	123,770 (53.3)	1,417,039 (51.4)
Birth weight	(gram)	1730 (1344,2070)	2685 (2375,2991)	3240 (2950,3545)	3610 (3310,3920)	3820 (3500,4145)	3530 (3181,3870)
	(SD)	-0.86 (-1.83, 0.05)	-0.26 (-1.15, 0.62)	0.01 (-0.76, 0.82)	-0.07 (-0.79, 0.67)	-0.40 (-1.12, 0.33)	-0.10 (-0.84, 0.67)
Maternal age	<=24	8,994 (25.4)	31,383 (26.6)	118,863 (24.2)	482,818 (25.7)	66,062 (28.4)	708,120 (25.7)
	25-29	11,458 (32.4)	40,114 (34.0)	172,218 (35.0)	704,332 (37.4)	86,034 (37.0)	1,014,156 (36.8)
	30-35	10,726 (30.3)	34,174 (28.9)	148,036 (30.1)	546,001 (29.0)	63,632 (27.4)	802,569 (29.1)
	>=36	4,166 (11.8)	12,474 (10.6)	52,543 (10.7)	148,637 (7.9)	16,541 (7.1)	234,361 (8.5)
Previous births	0	16,249 (46.0)	53,328 (45.1)	190,443 (38.7)	765,788 (40.7)	111,921 (48.2)	1,137,729 (41.2)
	>=1	19,095 (54.0)	64,817 (54.9)	301,217 (61.3)	1,116,000 (59.3)	120,348 (51.8)	1,621,477 (58.8)
Denmark							
Birth year	<=1985	4,303 (22.7)	13,216 (24.8)	46,098 (23.4)	281,679 (28.9)	32,320 (27.0)	377,616 (27.7)
	>1985	14,615 (77.3)	40,059 (75.2)	151,255 (76.6)	694,019 (71.1)	87,303 (73.0)	987,251 (72.3)
Sex	Male	10,363 (54.8)	29,005 (54.4)	104,416 (52.9)	494,220 (50.7)	61,930 (51.8)	699,934 (51.3)
Birth weight	(gram)	1640 (1300, 1980)	2535 (2220, 2858)	3120 (2810, 3450)	3520 (3216, 3850)	3750 (3440, 4090)	3470 (3100, 3800)
	(SD)	-0.9 (-1.9, 0.0)	-0.5 (-1.4, 0.5)	-0.1 (-0.9, 0.8)	-0.1 (-0.9, 0.7)	-0.5 (-1.2, 0.3)	-0.2 (-1.0, 0.6)
Maternal age	<=24	4,543 (24.0)	13,562 (25.5)	47,072 (23.9)	238,709 (24.5)	30,440 (25.4)	334,326 (24.5)
	25-29	6,670 (35.3)	19,577 (36.7)	72,667 (36.8)	387,041 (39.7)	48,108 (40.2)	534,063 (39.1)
	30-35	5,837 (30.9)	15,357 (28.8)	60,069 (30.4)	284,619 (29.2)	33,979 (28.4)	399,861 (29.3)
	>=36	1,868 (9.9)	4,779 (9.0)	17,545 (8.9)	65,329 (6.7)	7,096 (5.9)	96,617 (7.1)
Previous births	0	10,380 (54.9)	27,766 (52.1)	87,045 (44.1)	431,503 (44.2)	60,920 (50.9)	617,614 (45.3)
	>=1	8,538 (45.1)	25,509 (47.9)	110,308 (55.9)	544,195 (55.8)	58,703 (49.1)	747,253 (54.7)
Finland							
Birth year	>1985	2,460 (100.0)	8,748 (100.0)	40,775 (100.0)	167,927 (100.0)	9,593 (100.0)	229,503 (100.0)
Sex	Male	1,375 (55.9)	4,705 (53.8)	21,485 (52.7)	84,925 (50.6)	4,965 (51.8)	117,455 (51.2)
Birth weight	(gram)	1680 (1310, 2060)	2720 (2390, 3050)	3310 (3010, 3620)	3665 (3370, 3970)	3840 (3550, 4150)	3580 (3250, 3915)
	(SD)	-0.80 (-1.81, 0.11)	-0.17 (-1.11, 0.80)	0.20 (-0.59, 1.04)	0.09 (-0.62, 0.83)	-0.26 (-0.96, 0.42)	0.08 (-0.66, 0.84)
Maternal age	<=24	545 (22.2)	2,107 (24.1)	8,715 (21.4)	38,323 (22.8)	2,480 (25.9)	52,170 (22.7)
	25-29	799 (32.5)	2,868 (32.8)	14,428 (35.4)	63,981 (38.1)	3,739 (39.0)	85,815 (37.4)

(Continued)

eTable 1. Baseline Characteristics

		Categories of gestation (weeks)					
Characteristic		23-33	34-36	37-38	39-41	42-44	Overall
	30-35	744 (30.2)	2,613 (29.9)	12,517 (30.7)	49,827 (29.7)	2,719 (28.3)	68,420 (29.8)
	>=36	372 (15.1)	1,160 (13.3)	5,115 (12.5)	15,796 (9.4)	655 (6.8)	23,098 (10.1)
Previous births	0	1,224 (49.9)	3,978 (45.6)	15,488 (38.1)	65,658 (39.2)	5,110 (53.5)	91,458 (40.0)
	>=1	1,230 (50.1)	4,742 (54.4)	25,176 (61.9)	101,803 (60.8)	4,439 (46.5)	137,390 (60.0)

SD: standard deviation. For continuous variables (age, weight) the median (Q1,Q3) is displayed.

*The study population included all liveborn children recorded in the Norwegian MBR from 1967 to 2002, the Swedish MBR from 1974 to 2002, the Danish MBR from 1978 to 2001 and the Finnish MBR from 1987 to 1990.

eTable 2. Excluded and Included Individuals According to Gestational Age by Country*

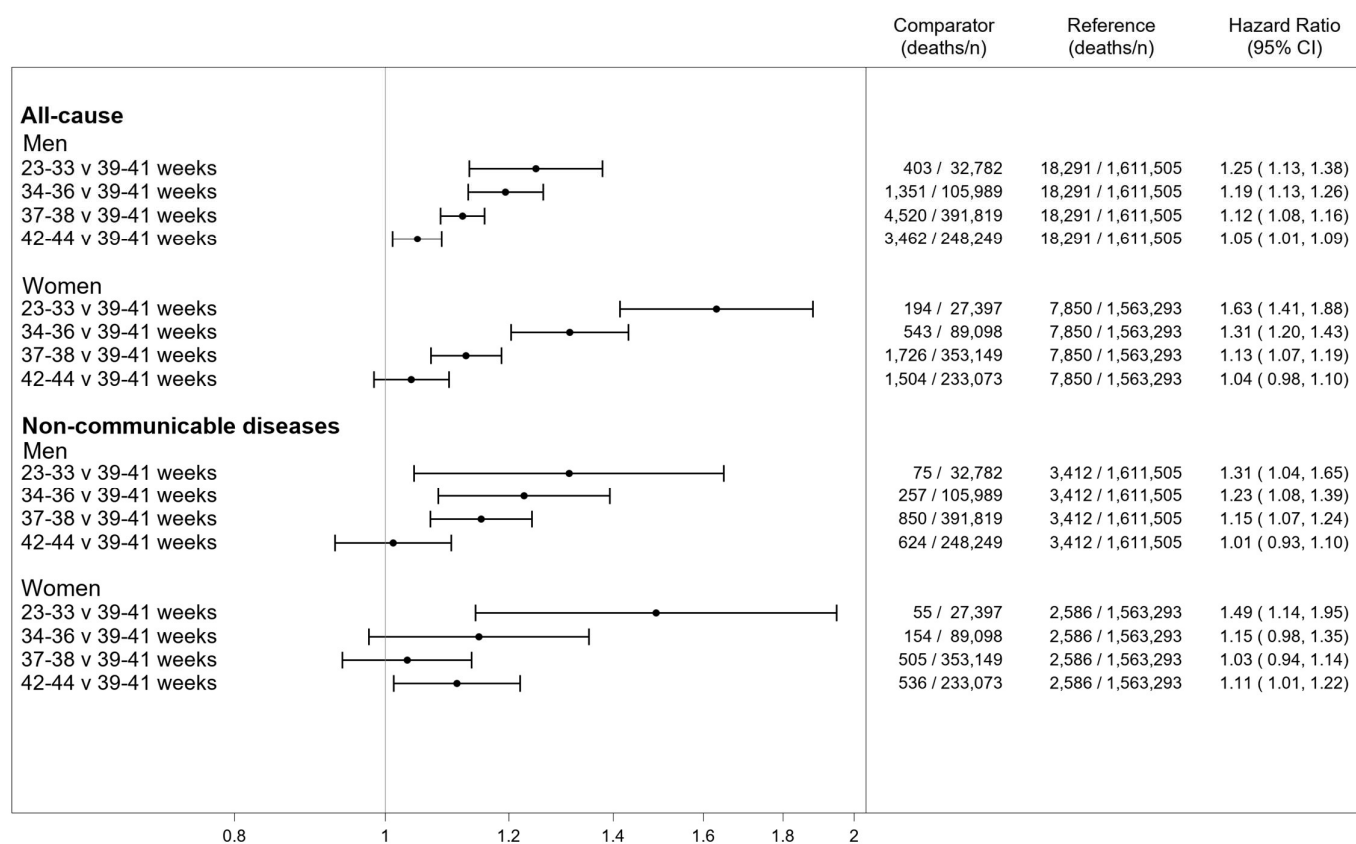
	Gestational age (weeks)							overall
	23-33	34-36	37-38	39-41	42-45	<23 or >45	Missing GA	
Norway n (%)								
Study population	34036 (1.7)	80187 (4.1)	259313 (13.2)	1315670 (67.0)	253293 (12.9)	19829 (1.0)	0 (0.0)	1,962,328
Dead before 15 years	5963 (24.8)	1963 (8.2)	2764 (11.5)	9112 (37.9)	2046 (8.5)	593 (2.5)	1588 (6.6)	24,029
Emigrated before 15 years	91 (1.8)	217 (4.3)	864 (17.0)	3261 (64.3)	437 (8.6)	38 (0.7)	164 (3.2)	5072
Missing information	2952 (2.5)	458 (0.4)	385 (0.3)	1202 (1.0)	229 (0.2)	916 (0.8)	113493 (94.9)	119,635
Sweden n (%)								
Study population	43986 (1.5)	125743 (4.4)	514476 (17.8)	1962341 (67.9)	242769 (8.4)	132 (0.0)	0 (0.0)	2889447
Dead before 15 years	6177 (27.3)	2548 (11.3)	3610 (15.9)	8612 (38.0)	1337 (5.9)	116 (0.5)	242 (1.1)	22642
Emigrated before 15 years	1223 (1.2)	4177 (4.2)	17605 (17.7)	67451 (67.9)	8603 (8.7)	0 (0.0)	336 (0.3)	99395
Missing information	1238 (7.7))	871 (5.4)	1597 (9.9)	4482 (27.7)	561 (3.5)	9 (0.1)	7423 (45.9)	16181
Denmark n (%)								
Study population	18918 (1.4)	53275 (3.9)	197353 (14.5)	975698 (71.5)	119623 (8.8)	69 (0.0)	0 (0.0)	1364936
Dead before 15 years	3473 (25.2)	1242 (9.0%)	1837 (13.3)	5569 (40.4)	719 (5.2)	117 (0.9)	842 (6.1)	13799
Emigrated before 15 years	251 (1.2)	761 (3.4)	3144 (15.2)	13896 (67.3)	1653 (8.0)	0 (0.0)	954 (4.6)	20659
Missing information	619 (0.8)	744 (1.0)	1832 (2.4)	6074 (7.9)	867 (1.1)	39 (0.1)	66483 (86.3)	76658
Finland n (%)								
Study population	2444 (1.1)	8668 (3.8)	40380 (17.8)	166309 (73.2)	9480 (4.2)	0 (0.0)	0 (0.0)	228848
Dead before 15 years	551 (27.9)	191 (9.7)	311 (15.8)	797 (40.4)	44 (2.2)	27 (1.4)	52 (2.6)	1973
Emigrated before 15 years	9 (0.9)	37 (3.7)	165 (16.4)	711 (70.7)	49 (4.9)	0 (0.0)	35 (3.5)	1006
Missing information	109 (2.9)	58 (1.5)	135 (3.6)	496 (13.1)	46 (1.2)	0 (0.0)	2953 (77.8)	3797

Study population did not include individuals with a gestational age <23 or >45 weeks of gestation.

Missing information included individuals with missing or implausible information on gestational age, birth weight or parity.

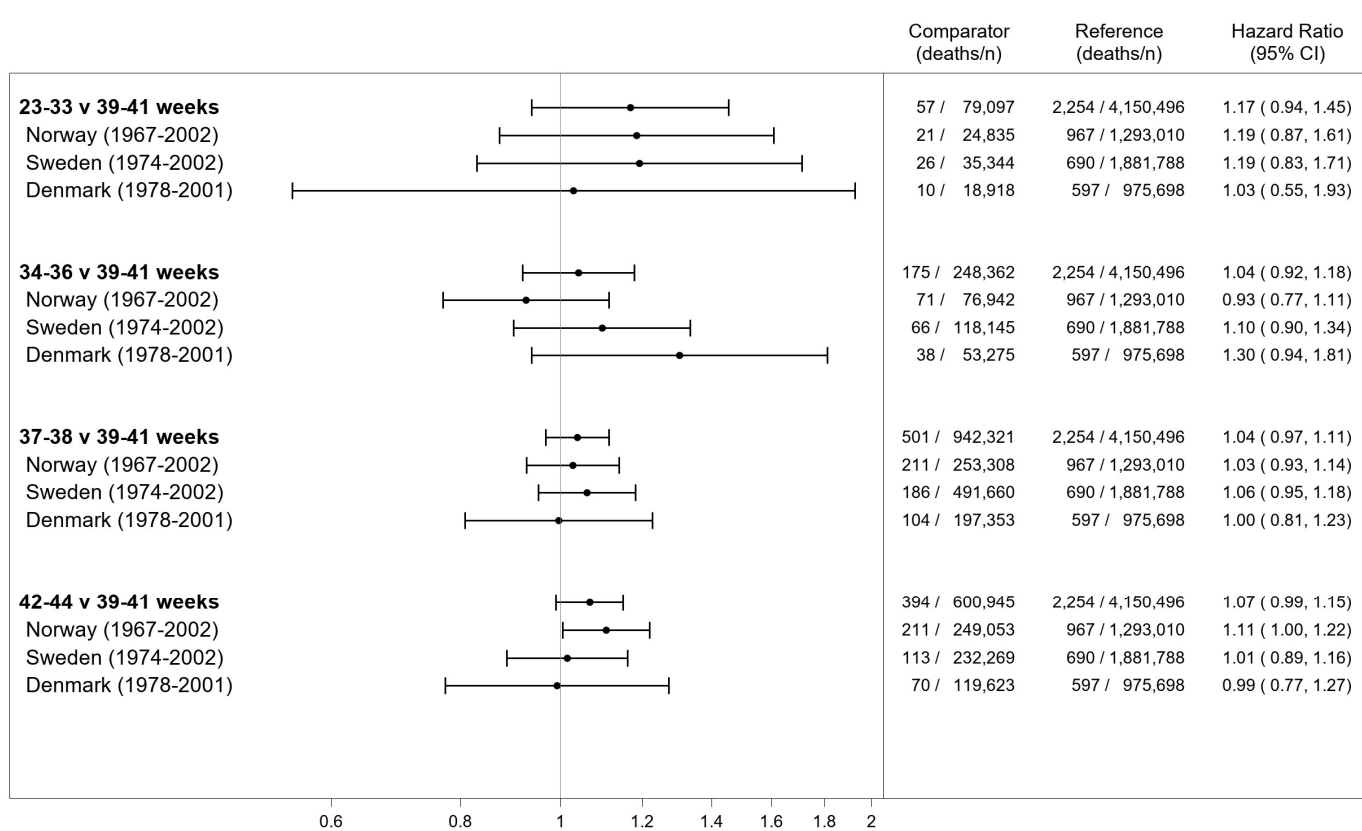
*The study population included all liveborn children recorded in the Norwegian MBR from 1967 to 2002, the Swedish MBR from 1974 to 2002, the Danish MBR from 1978 to 2001 and the Finnish MBR from 1987 to 1990.

eFigure 1. Hazard Ratio and 95% CI for Sex Differences in All-Cause Mortality and Noncommunicable Disease Mortality According to Gestational Age Categories for Norway and Sweden Combined



CI: confidence interval. n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information
 Cox regression adjusting for country, birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)

eFigure 2. Cancer Mortality by Country and Overall: Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age

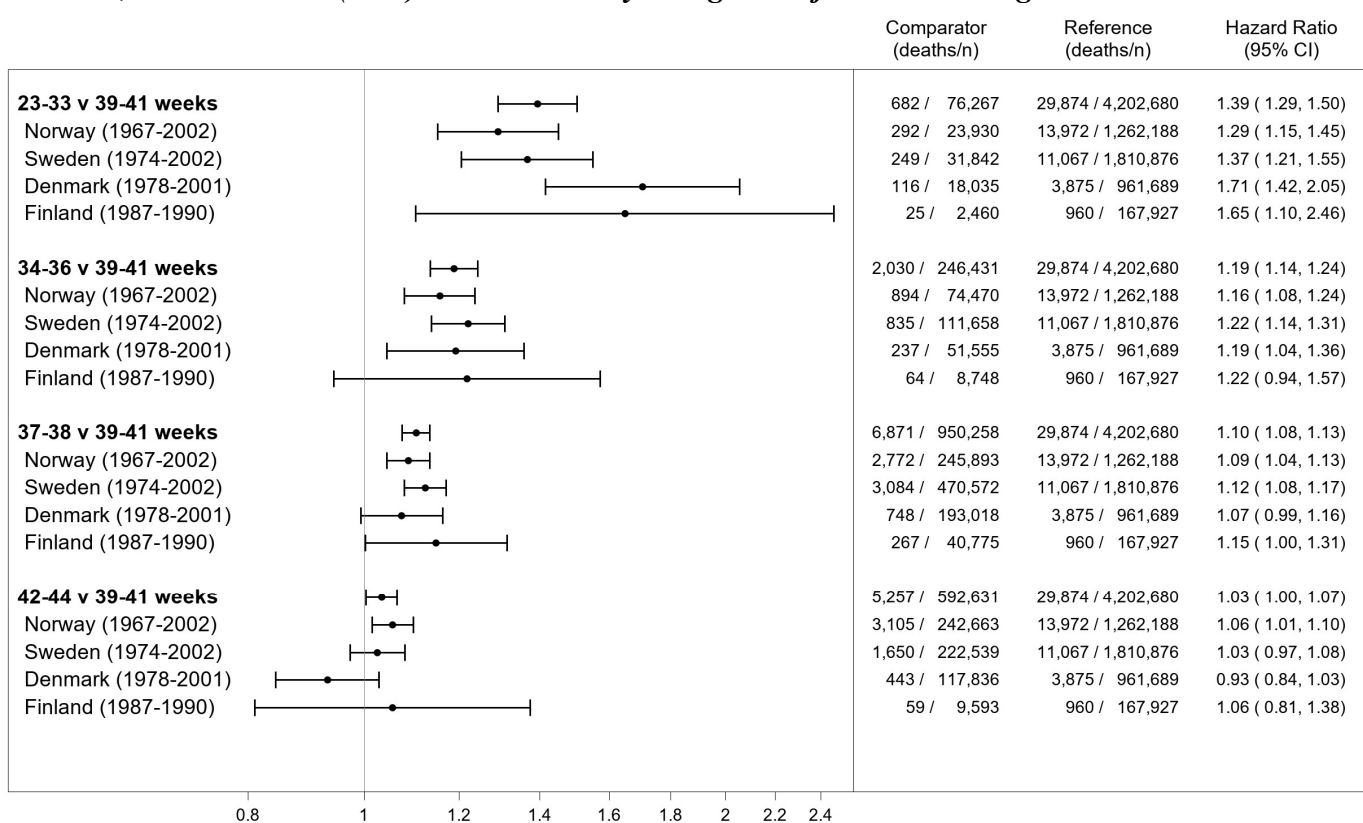


CI: confidence interval, HR: hazard ratio
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eTable 3. Mortality From Specific NCDs by Country and Overall, Excluding Individuals With Congenital Anomalies, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age

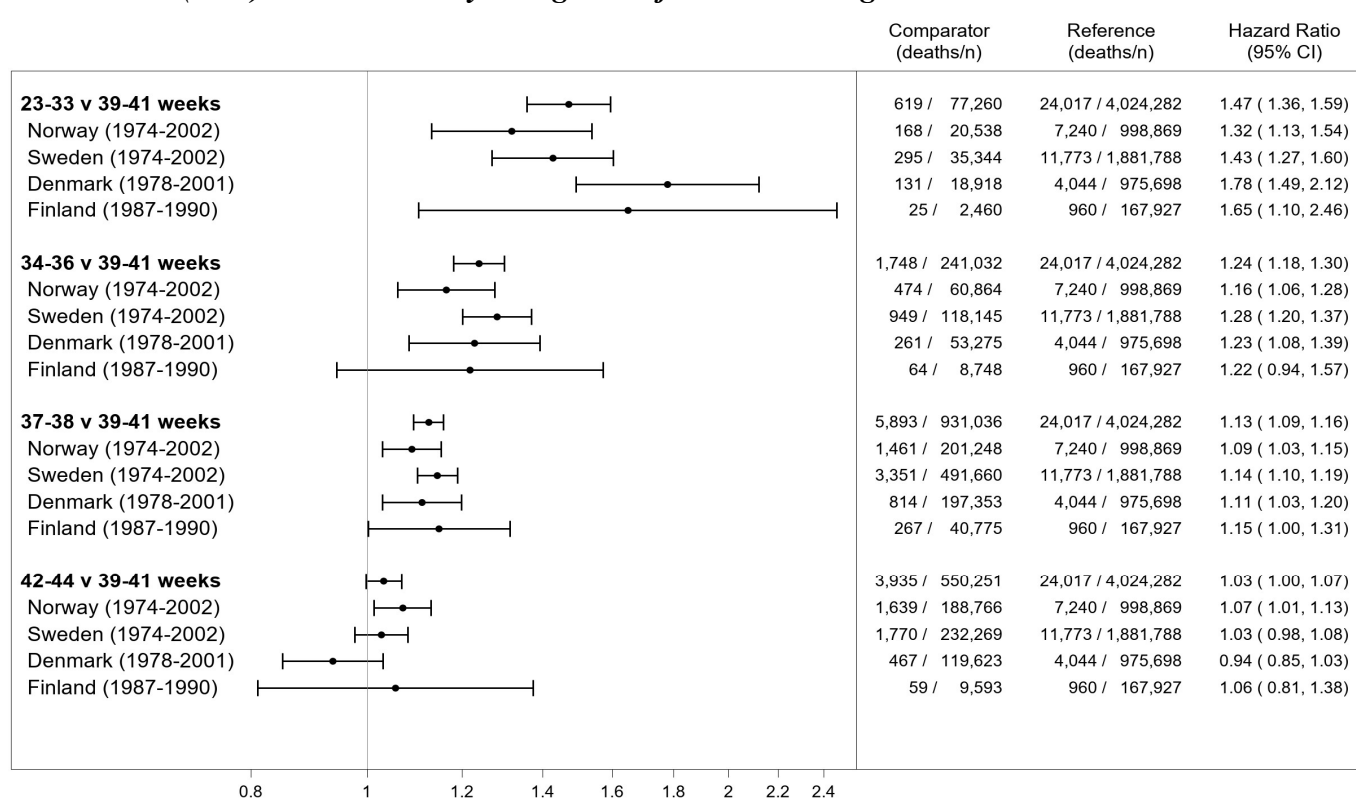
	Norway (1967-2002)		Sweden (1974-2002)		Combined	
Gestational age (wks)	deaths/n	HR (95% CI)	deaths/n	HR (95% CI)	deaths/n	HR (95% CI)
Diabetes						
23-36	25 / 98,400	1.87 (1.23, 2.84)	14 / 143,500	2.01 (1.14, 3.53)	39 / 241,900	1.90 (1.36, 2.66)
37-38	43 / 245,893	1.28 (0.92, 1.79)	46 / 470,572	2.06 (1.45, 2.95)	89 / 716,465	1.59 (1.25, 2.02)
39-41	184 / 1,262,188	Reference	90 / 1,810,876	Reference	274 / 3,073,064	Reference
42-44	45 / 242,663	1.11 (0.80, 1.54)	13 / 222,539	0.98 (0.54, 1.76)	58 / 465,202	1.10 (0.82, 1.46)
Chronic lung diseases						
23-36	10 / 98,400	2.27 (1.16, 4.42)	6 / 143,500	2.53 (1.05, 6.10)	16 / 241,900	2.32 (1.37, 3.95)
37-38	12 / 245,893	1.06 (0.57, 1.96)	9 / 470,572	1.26 (0.60, 2.65)	21 / 716,465	1.13 (0.70, 1.82)
39-41	65 / 1,262,188	Reference	30 / 1,810,876	Reference	95 / 3,073,064	Reference
42-44	11 / 242,663	0.75 (0.40, 1.44)	2 / 222,539	0.41 (0.10, 1.74)	13 / 465,202	0.67 (0.37, 1.20)
Stroke						
23-36	18 / 98,400	1.36 (0.84, 2.20)	6 / 143,500	0.74 (0.32, 1.68)	24 / 241,900	1.13 (0.74, 1.71)
37-38	25 / 245,893	0.74 (0.49, 1.12)	19 / 470,572	0.79 (0.48, 1.28)	44 / 716,465	0.76 (0.56, 1.05)
39-41	194 / 1,262,188	Reference	101 / 1,810,876	Reference	295 / 3,073,064	Reference
42-44	42 / 242,663	0.98 (0.70, 1.37)	18 / 222,539	1.10 (0.66, 1.83)	60 / 465,202	1.00 (0.76, 1.33)
Other CVD						
23-36	73 / 98,400	1.37 (1.08, 1.74)	67 / 143,500	1.67 (1.30, 2.16)	140 / 241,900	1.49 (1.25, 1.77)
37-38	176 / 245,893	1.30 (1.10, 1.53)	146 / 470,572	1.14 (0.95, 1.36)	322 / 716,465	1.22 (1.08, 1.38)
39-41	743 / 1,262,188	Reference	528 / 1,810,876	Reference	1,271 / 3,073,064	Reference
42-44	165 / 242,663	1.07 (0.90, 1.27)	90 / 222,539	1.14 (0.91, 1.43)	255 / 465,202	1.09 (0.95, 1.25)

eFigure 3. All-Cause Mortality by Country and Overall, Excluding Individuals With Congenital Anomalies, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



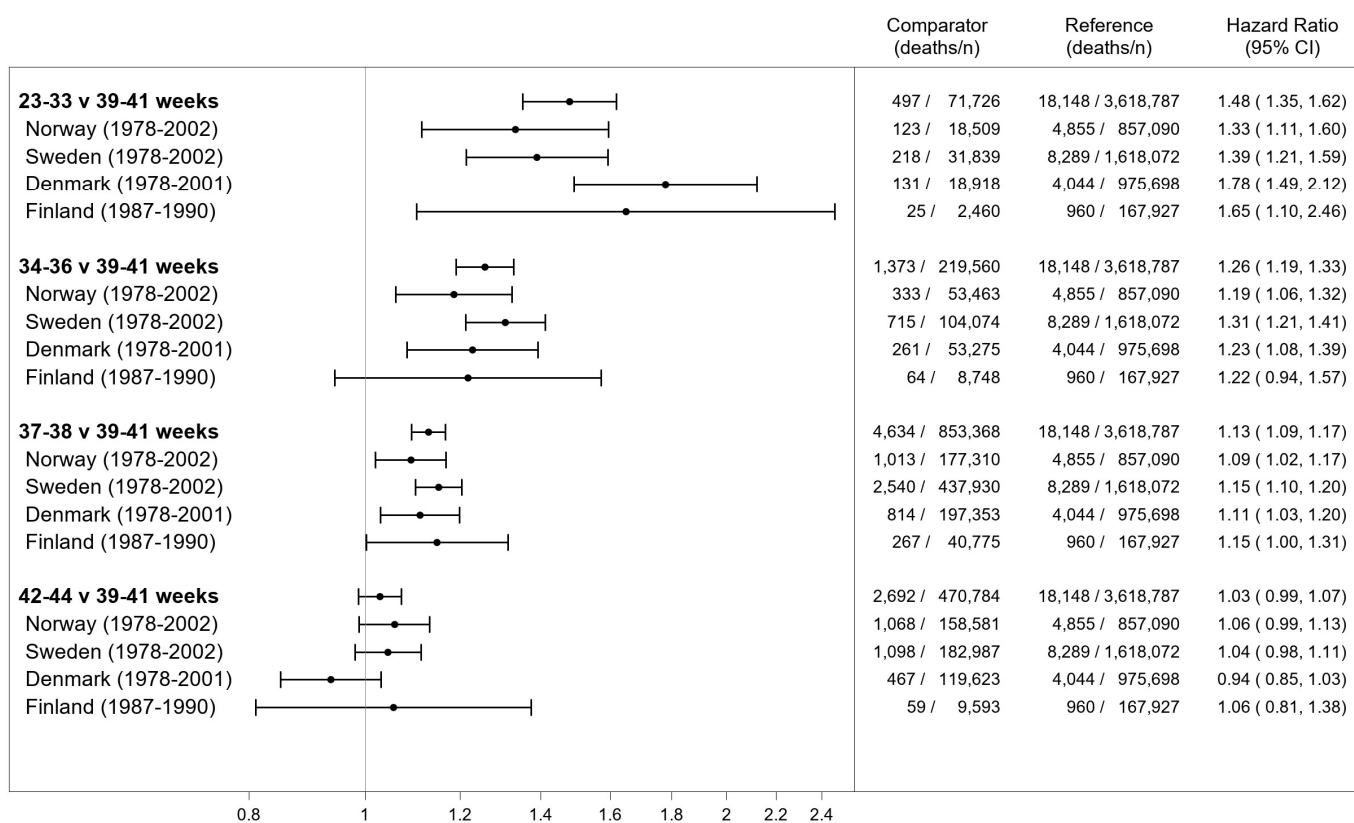
CI: confidence interval, HR: hazard ratio *Sensitivity analysis: excluding individuals with congenital anomalies (Norway, Sweden and Denmark only)
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eFigure 4. All-Cause Mortality by Country and Overall, Restricting Birth Year to 1974 and Onward, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



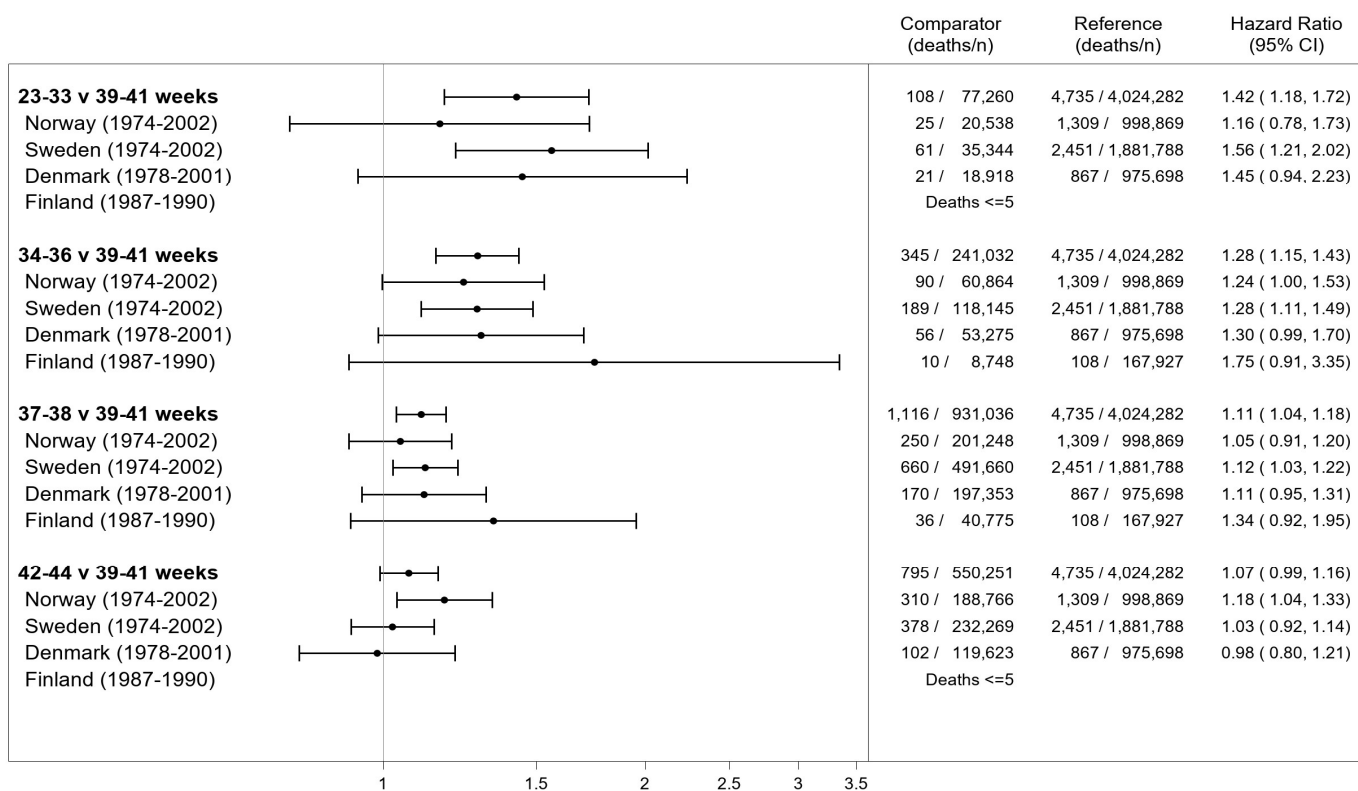
CI: confidence interval, HR: hazard ratio. *Sensitivity analysis: Norway birth year from 1974
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eFigure 5. All-Cause Mortality by Country and Overall, Restricting Birth Year to 1978 and Onwards, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



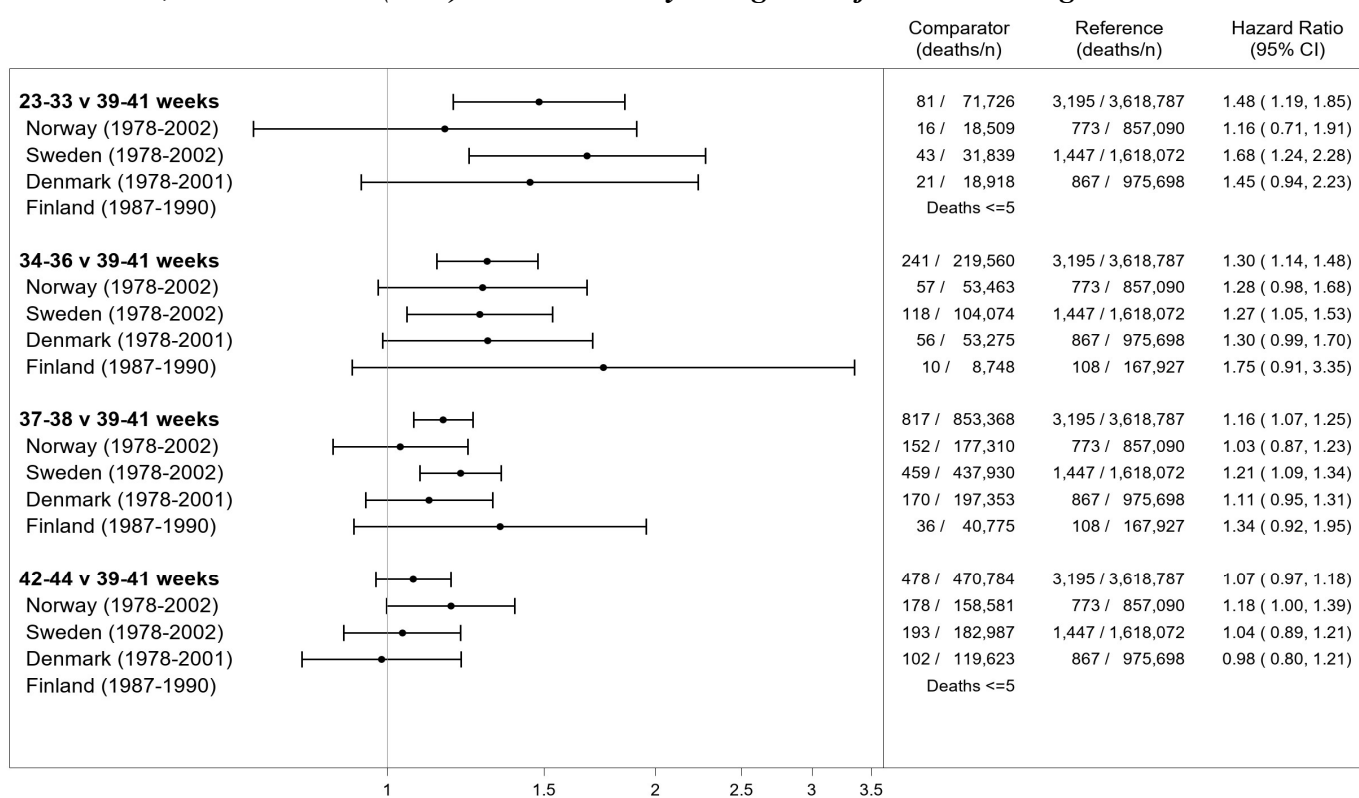
CI: confidence interval, HR: hazard ratio. *Sensitivity analysis: Norway and Sweden birth year from 1978
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EJM 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eFigure 6. Noncommunicable Disease Mortality by Country and Overall, Restricting Birth Year to 1974 and Onward, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



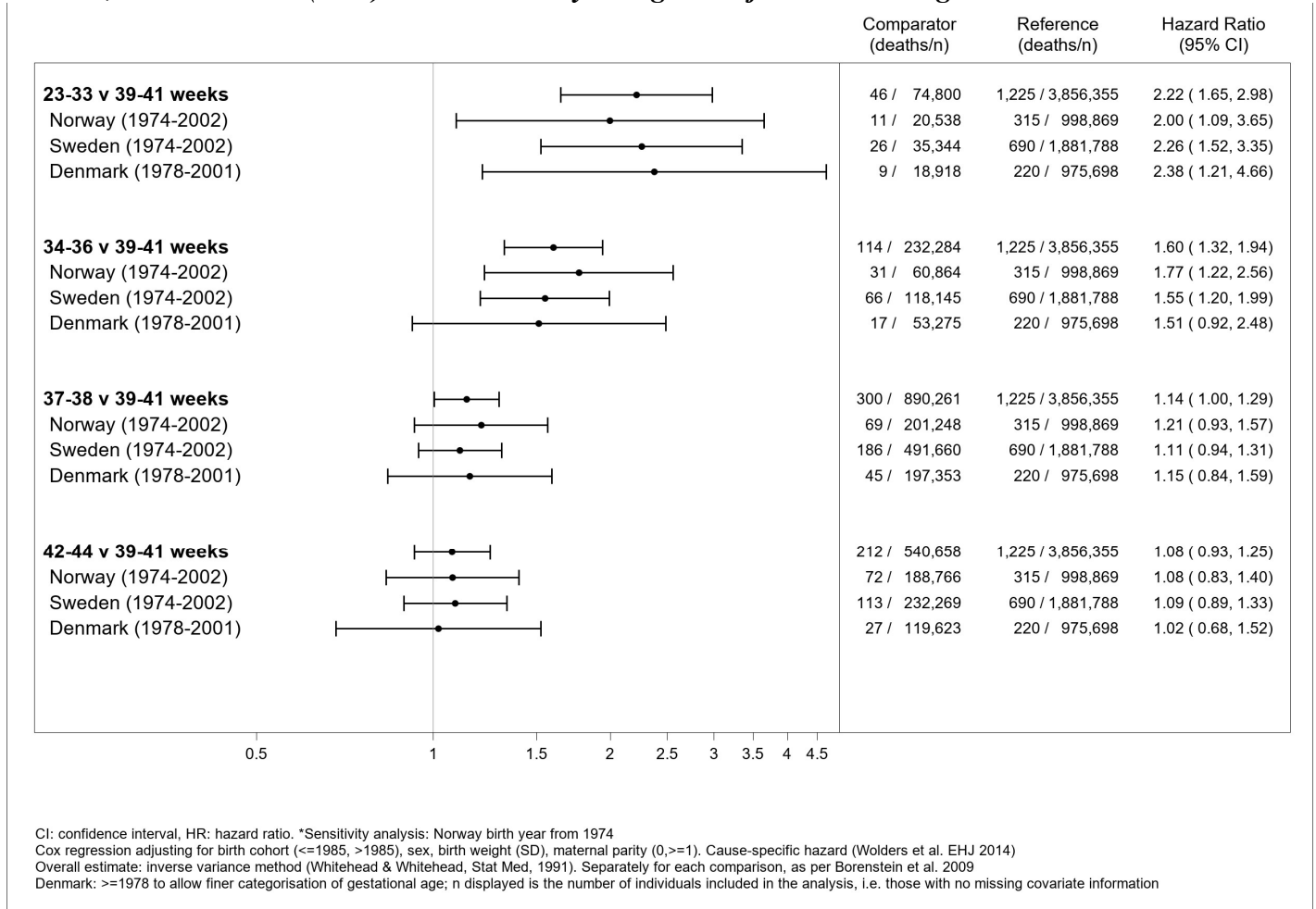
CI: confidence interval, HR: hazard ratio. *Sensitivity analysis: Norway birth year from 1974
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eFigure 7. Noncommunicable Disease Mortality by Country and Overall, Restricting Birth Year to 1978 and Onwards, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age

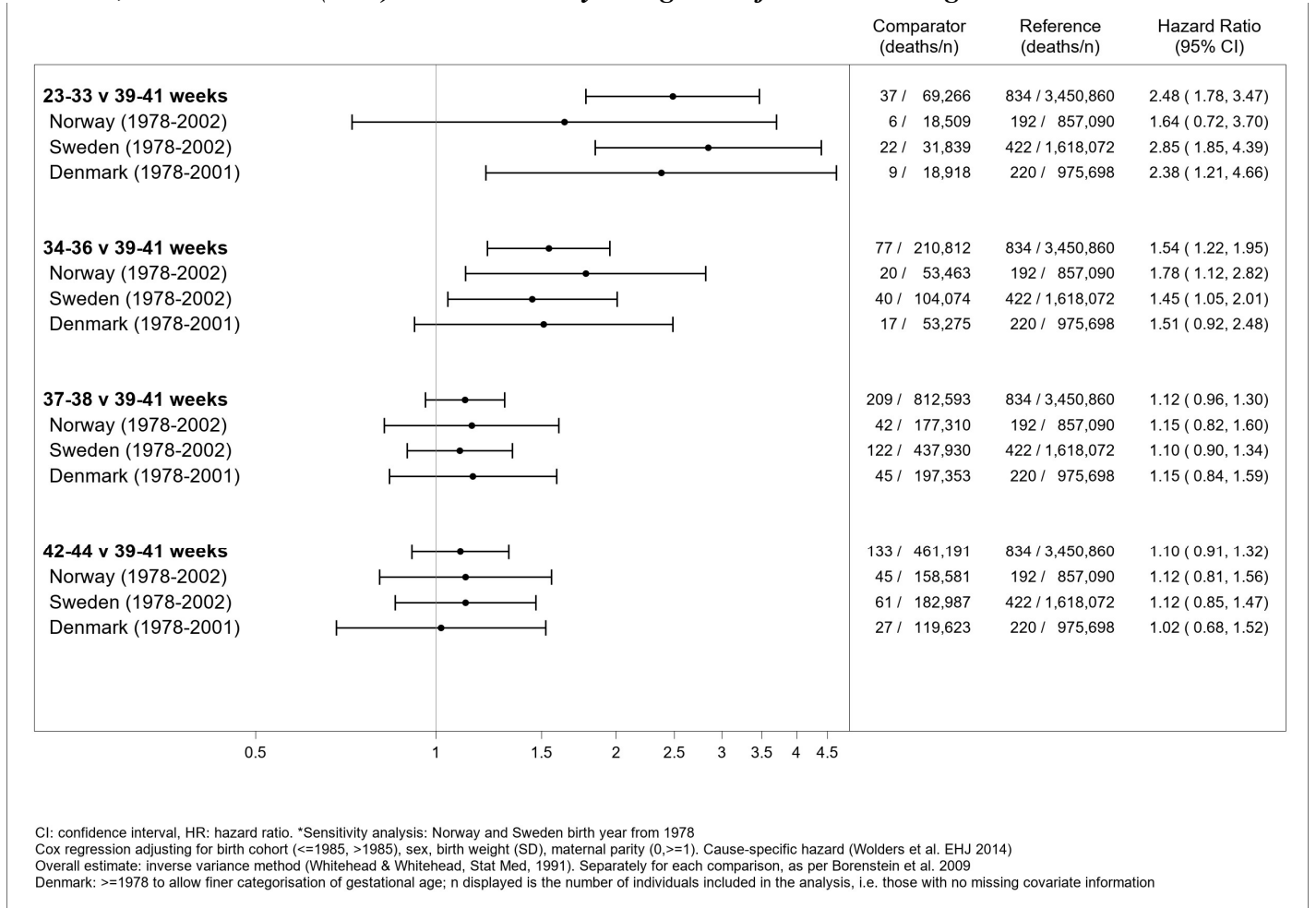


CI: confidence interval, HR: hazard ratio. *Sensitivity analysis: Norway and Sweden birth year from 1978
 Cox regression adjusting for birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)
 Overall estimate: inverse variance method (Whitehead & Whitehead, Stat Med, 1991). Separately for each comparison, as per Borenstein et al. 2009
 Denmark: >=1978 to allow finer categorisation of gestational age; n displayed is the number of individuals included in the analysis, i.e. those with no missing covariate information

eFigure 8. Cardiovascular Disease Mortality by Country and Overall, Restricting Birth Year to 1974 and Onward, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



eFigure 9. Cardiovascular Disease Mortality by Country and Overall, Restricting Birth Year to 1978 and Onwards, Hazard Ratios (HRs) and 95% CIs by Categories of Gestational Age



eTable 4. Hazard Ratio (95% CI) for Sibling Analysis*

Mortality Outcome	Gestational age (wks)	Deaths / N		HR (95% CI)
All-causes	23-33 weeks	460 /	50,782	1.34 (1.15, 1.57)
	34-36 weeks	1,516 /	167,010	1.18 (1.09, 1.29)
	37-38 weeks	4,923 /	645,395	1.08 (1.03, 1.14)
	39-41 weeks	21,076 / 2,761,361		Reference
	42-44 weeks	4,040 /	412,059	1.03 (0.98, 1.09)
NCDs	23-33 weeks	101 /	50,782	1.29 (0.90, 1.84)
	34-36 weeks	310 /	167,010	1.15 (0.95, 1.40)
	37-38 weeks	1,029 /	645,395	1.07 (0.96, 1.20)
	39-41 weeks	4,652 / 2,761,361		Reference
	42-44 weeks	914 /	412,059	1.04 (0.92, 1.17)
Cardiovascular disease	23-33 weeks	38 /	50,782	1.75 (0.91, 3.34)
	34-36 weeks	103 /	167,010	1.06 (0.75, 1.52)
	37-38 weeks	297 /	645,395	1.10 (0.89, 1.37)
	39-41 weeks	1,288 / 2,761,361		Reference
	42-44 weeks	256 /	412,059	1.01 (0.81, 1.27)

*Siblings analysis population includes any individual with siblings. NCD: Non-communicable diseases. Stratified Cox regression including mothers as strata, adjusting for country, birth cohort (<=1985, >1985), sex, birth weight (SD), maternal parity (0,>=1). Cause-specific hazard (Wolders et al. EHJ 2014)