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8

9 **Figures**

10 **Supplementary file 4 Figure S1** The overall anemia burden in the world, China, Japan, and South
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14 China, Japan, and South Korea from 1990 to 2021; D. Age-standardized rates of YLD due to anemia
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16 **Supplementary file 5 Figure S2** The sex-specific anemia burden in the world, China, Japan, and
17 South Korea from 1990 to 2021. A. Prevalent anemia cases in males and females in the world, China,
18 Japan, and South Korea from 1990 to 2021; B. Age-standardized rates of anemia prevalence in
19 males and females in the world, China, Japan, and South Korea from 1990 to 2021; C. YLDs due to
20 anemia in males and females in the world, China, Japan, and South Korea from 1990 to 2021; D.
21 Age-standardized rates of YLD due to anemia in males and females in the world, China, Japan, and
22 South Korea from 1990 to 2021.

23 **Supplementary file 6 Figure S3** The trend of the total population (A) and age of populations
24 structure (B) in the world, China, Japan, and South Korea from 1990 to 2021. The red line and black
25 line indicate the numbers of birth and death in each year.
26

27 Table S1. Definitions of anemia severity and corresponding disability weights in GBD 2021.

	Mild	Moderate	Severe
Age 0-6 days			
Males/Females	145-159	100-144	<100
Age 7-27 days			
Males/Females	120-134	85-119	<85
Age 1 month- 4 years			
Males/Females	100-109	70-99	<70
Age 5-14 years			
Males/Females	110-114	70-99	<70
Age ≥ 15 years			
Males	110-129	80-109	<80
Females, non-pregnant	110-119	80-109	<80
Females, pregnant	100-109	70-99	<70
Disability weights	0.004	0.052	0.149
(95% UI)	(0.001-0.008)	(0.034-0.076)	(0.101-0.209)

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Table S2. Joinpoint analysis of age-standardized rate of prevalence.

	Sex	Segment	Period	APC/AAPC* (95% CI)	Test Statistic	P-Value
World	Both	0	1990-2005	-0.38(-0.39, -0.37)	-164.11	<0.001
		1	2005-2009	-0.76(-0.89, -0.63)	-209.01	<0.001
		2	2009-2018	-0.33(-0.36, -0.3)	-88.57	<0.001
		3	2018-2021	-0.02(-0.18, 0.14)	-13.2	<0.001
		Full Range	1990-2021	-0.38(-0.41, -0.36)	-228.42	<0.001
	Female	0	1990-2006	-0.24(-0.25, -0.24)	-257.44	<0.001
		1	2006-2009	-0.46(-0.66, -0.25)	-106.2	<0.001
		2	2009-2017	-0.02(-0.05, 0.01)	-13.85	<0.001
		3	2017-2021	0.24(0.16, 0.33)	-88.42	<0.001
		Full Range	1990-2021	-0.15(-0.17, -0.12)	-137.84	<0.001
	Male	0	1990-2002	-0.57(-0.59, -0.55)	-38.39	<0.001
		1	2002-2006	-0.87(-1.09, -0.66)	-8.37	<0.001
		2	2006-2009	-1.29(-1.72, -0.87)	-183.21	<0.001
		3	2009-2021	-0.8(-0.83, -0.78)	-234.75	<0.001
		Full Range	1990-2021	-0.77(-0.82, -0.72)	-98.77	<0.001
China	Both	0	1990-2000	-2.13(-2.16, -2.11)	-59.27	<0.001
		1	2000-2010	-3.24(-3.27, -3.21)	-104.19	<0.001
		2	2010-2018	-2.16(-2.21, -2.11)	-44.89	<0.001
		3	2018-2021	-1.32(-1.52, -1.11)	61.57	<0.001
		Full Range	1990-2021	-2.42(-2.45, -2.39)	-13.95	<0.001
	Female	0	1990-2000	-1.71(-1.73, -1.69)	-26.62	<0.001
		1	2000-2010	-2.25(-2.27, -2.23)	-9.23	<0.001
		2	2010-2018	-1.42(-1.45, -1.4)	23.36	<0.001
		3	2018-2021	-0.76(-0.87, -0.65)	-37.89	<0.001
		Full Range	1990-2021	-1.72(-1.73, -1.7)	-36.28	<0.001
	Male	0	1990-2000	-2.73(-2.79, -2.66)	-4.5	<0.001
		1	2000-2011	-4.72(-4.79, -4.65)	7.94	<0.001
		2	2011-2018	-3.26(-3.44, -3.09)	-99.4	<0.001
		3	2018-2021	-2.21(-2.76, -1.67)	-21.96	<0.001
		Full Range	1990-2021	-3.51(-3.58, -3.44)	-35.57	<0.001
Japan	Both	0	1990-1993	-3.23(-3.34, -3.12)	-43.75	<0.001
		1	1993-1999	-2.3(-2.34, -2.25)	-166.43	<0.001
		2	1999-2005	-0.96(-1, -0.92)	-45.7	<0.001
		3	2005-2021	0.25(0.24, 0.26)	-8.87	<0.001
		Full Range	1990-2021	-0.82(-0.84, -0.81)	-136.39	<0.001
	Female	0	1990-1993	-3.09(-3.54, -2.63)	-10.66	<0.001
		1	1993-1999	-2.26(-2.44, -2.09)	-15.4	<0.001
		2	1999-2004	-0.95(-1.16, -0.73)	-3.99	0.001
		3	2004-2021	0.32(0.29, 0.35)	-50.8	<0.001
		Full Range	1990-2021	-0.72(-0.78, -0.66)	-140.76	<0.001
	Male	0	1990-1995	-3.17(-3.34, -3)	-39.13	<0.001

		1	1995-2004	-1.7(-1.79, -1.6)	-8.17	<0.001
		2	2004-2012	-0.28(-0.41, -0.15)	-116.39	<0.001
		3	2012-2021	0.33(0.24, 0.41)	-59.39	<0.001
		Full Range	1990-2021	-0.99(-1.04, -0.94)	-104.6	<0.001
South	Both	0	1990-1994	-4.96(-5.19, -4.73)	-69.19	<0.001
Korea		1	1994-2005	-3.8(-3.85, -3.76)	-11.88	<0.001
		2	2005-2014	-1.6(-1.67, -1.53)	-23.14	<0.001
		3	2014-2021	-0.38(-0.47, -0.29)	-0.32	0.749
		Full Range	1990-2021	-2.55(-2.6, -2.51)	-31.39	<0.001
	Female	0	1990-2003	-3.34(-3.39, -3.29)	-60.37	<0.001
		1	2003-2007	-2.02(-2.41, -1.63)	-4.62	<0.001
		2	2007-2014	-1(-1.14, -0.87)	-1.63	0.117
		3	2014-2021	-0.22(-0.33, -0.11)	5.91	<0.001
		Full Range	1990-2021	-1.94(-2.01, -1.88)	-12.41	<0.001
	Male	0	1990-1994	-6.77(-7.04, -6.5)	-51.48	<0.001
		1	1994-2005	-5.16(-5.23, -5.08)	-8.54	<0.001
		2	2005-2014	-2.6(-2.74, -2.46)	-6.33	<0.001
		3	2014-2021	-0.7(-0.88, -0.52)	-60.71	<0.001
		Full Range	1990-2021	-3.64(-3.71, -3.57)	-31.13	<0.001

31 * APC (annual percentage change) for each period and AAPC (average annual percentage change)
32 for the full range.

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Table S3. Joinpoint analysis of age-standardized rate of YLDs.

	Sex	Segment	Period	APC/AAPC* (95% CI)	Test Statistic	P-Value
World	Both	0	1990-2005	-0.48(-0.5, -0.46)	-134.49	<0.001
		1	2005-2009	-1.37(-1.6, -1.15)	-193.73	<0.001
		2	2009-2018	-0.98(-1.02, -0.93)	-85.87	<0.001
		3	2018-2021	-0.43(-0.65, -0.2)	-13.24	<0.001
		Full Range	1990-2021	-0.73(-0.77, -0.7)	-103.61	<0.001
	Female	0	1990-2005	-0.29(-0.3, -0.27)	-159.75	<0.001
		1	2005-2010	-0.82(-0.95, -0.7)	-73.6	<0.001
		2	2010-2018	-0.56(-0.62, -0.51)	-10.02	<0.001
		3	2018-2021	-0.09(-0.29, 0.11)	-101.69	<0.001
		Full Range	1990-2021	-0.43(-0.46, -0.4)	-111.37	<0.001
	Male	0	1990-2001	-0.74(-0.78, -0.69)	-56.75	<0.001
		1	2001-2005	-1.32(-1.65, -0.98)	-9.36	<0.001
		2	2005-2017	-1.9(-1.95, -1.86)	-176.55	<0.001
		3	2017-2021	-1.24(-1.46, -1.02)	-144.1	<0.001
		Full Range	1990-2021	-1.33(-1.38, -1.28)	-111.86	<0.001
China	Both	0	1990-2000	-2.32(-2.36, -2.29)	-33.56	<0.001
		1	2000-2010	-3.96(-4, -3.92)	-23.92	<0.001
		2	2010-2018	-2.64(-2.7, -2.58)	-10.55	<0.001
		3	2018-2021	-1.54(-1.78, -1.3)	30.87	<0.001
		Full Range	1990-2021	-2.86(-2.89, -2.83)	-48.1	<0.001
	Female	0	1990-2000	-1.52(-1.55, -1.49)	-8.24	<0.001
		1	2000-2010	-2.72(-2.75, -2.68)	10.79	<0.001
		2	2010-2018	-1.87(-1.93, -1.82)	6.93	<0.001
		3	2018-2021	-0.97(-1.17, -0.77)	-36.03	<0.001
		Full Range	1990-2021	-1.94(-1.97, -1.92)	-39.15	<0.001
	Male	0	1990-2001	-3.79(-3.87, -3.71)	-5.49	<0.001
		1	2001-2010	-6.85(-6.97, -6.72)	7.45	<0.001
		2	2010-2018	-4.62(-4.79, -4.46)	-29.77	<0.001
		3	2018-2021	-2.96(-3.6, -2.31)	-17.67	<0.001
		Full Range	1990-2021	-4.82(-4.9, -4.74)	-38.92	<0.001
Japan	Both	0	1990-1994	-3.13(-3.32, -2.94)	-24.92	<0.001
		1	1994-1999	-2.23(-2.42, -2.04)	-61.19	<0.001
		2	1999-2004	-1.02(-1.21, -0.82)	-26.31	<0.001
		3	2004-2021	0.32(0.3, 0.34)	-3.38	0.003
		Full Range	1990-2021	-0.76(-0.81, -0.71)	-8.61	<0.001
	Female	0	1990-1998	-2.59(-2.7, -2.48)	-45.84	<0.001
		1	1998-2004	-0.89(-1.11, -0.67)	-13.59	<0.001
		2	2004-2012	0.7(0.56, 0.83)	-0.43	0.672
		3	2012-2021	0.31(0.21, 0.4)	-35.74	<0.001
		Full Range	1990-2021	-0.58(-0.64, -0.52)	-115.25	<0.001
	Male	0	1990-1995	-3.53(-3.73, -3.33)	-32.16	<0.001

		1	1995-2004	-1.94(-2.04, -1.84)	-5.82	<0.001
		2	2004-2013	-0.27(-0.38, -0.17)	-53.03	<0.001
		3	2013-2021	0.37(0.27, 0.48)	-24.44	<0.001
		Full Range	1990-2021	-1.13(-1.18, -1.07)	-83.85	<0.001
South Korea	Both	0	1990-1994	-5.03(-5.43, -4.62)	-53.07	<0.001
	Both	1	1994-2006	-2.61(-2.69, -2.52)	-12.78	<0.001
		2	2006-2016	-1.46(-1.58, -1.35)	-41.29	<0.001
		3	2016-2021	-0.45(-0.72, -0.17)	-3.9	0.001
		Full Range	1990-2021	-2.21(-2.29, -2.13)	-35.44	<0.001
	Female	0	1990-1993	-3.21(-3.97, -2.45)	-13.46	<0.001
		1	1993-2008	-1.53(-1.6, -1.47)	-21.65	<0.001
		2	2008-2018	-0.86(-0.99, -0.73)	-0.93	0.365
		3	2018-2021	-0.14(-0.84, 0.55)	-33.78	<0.001
		Full Range	1990-2021	-1.35(-1.45, -1.24)	-8.13	<0.001
	Male	0	1990-1994	-8.4(-8.87, -7.94)	-85.62	<0.001
		1	1994-2006	-5.73(-5.83, -5.63)	-11.6	<0.001
		2	2006-2015	-2.71(-2.88, -2.53)	-38.05	<0.001
		3	2015-2021	-0.79(-1.08, -0.51)	-27.07	<0.001
		Full Range	1990-2021	-4.27(-4.37, -4.18)	-48.17	<0.001

35 * APC (annual percentage change) for each period and AAPC (average annual percentage change)
36 for the full range.

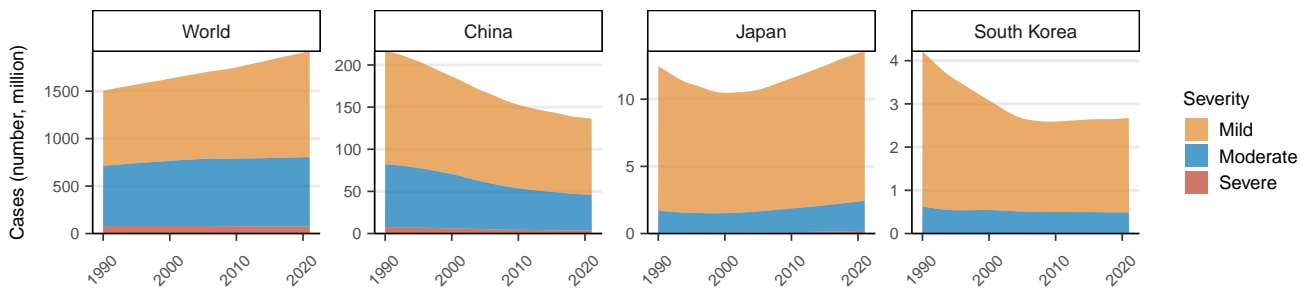
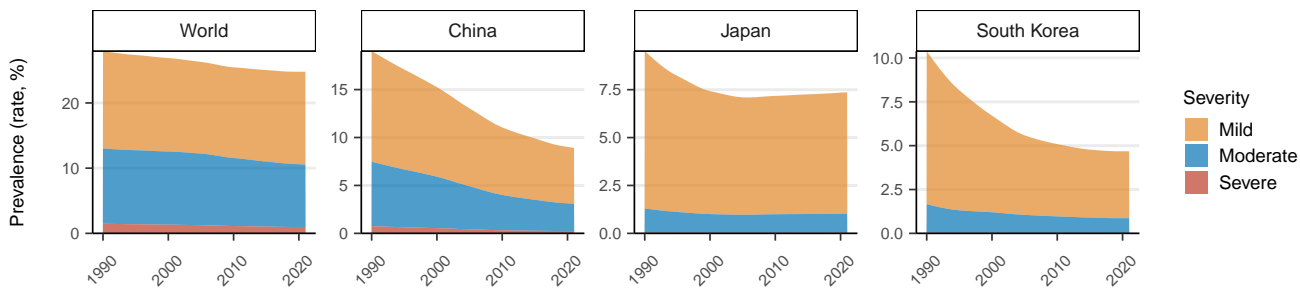
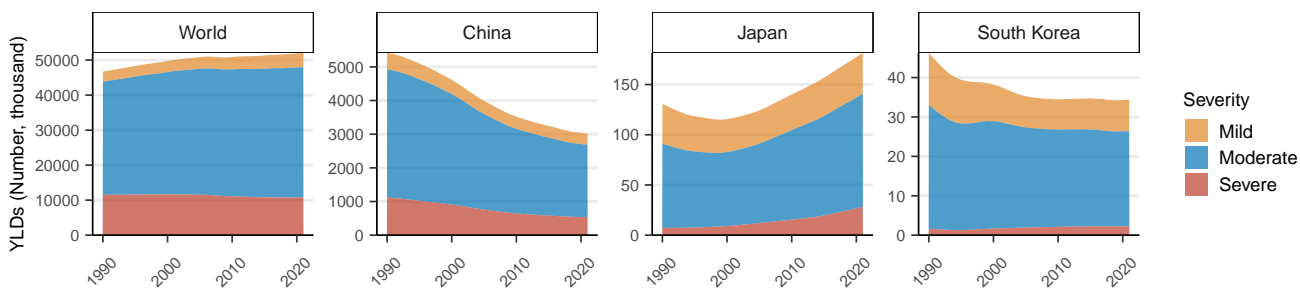
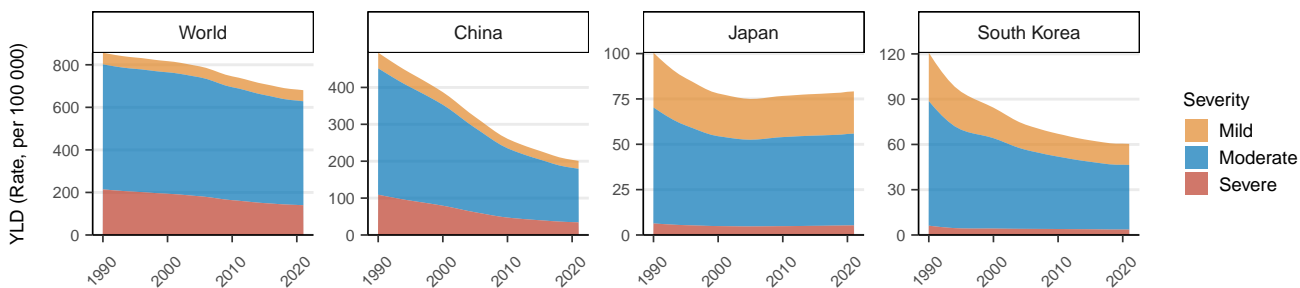
37 Abbreviations: YLDs, Years Lived with Disability.

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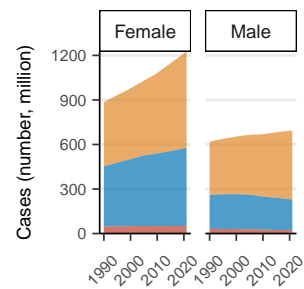
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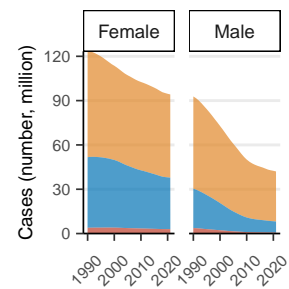
A**Prevalence (Number)****B****Age-standardized Prevalence (Rate)****C****YLDs (Number)****D****Age-standardized YLD (Rate)**

A

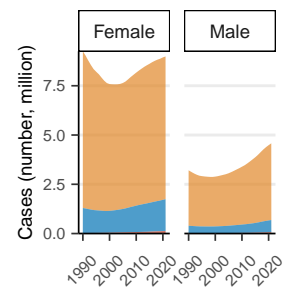
World

**B**

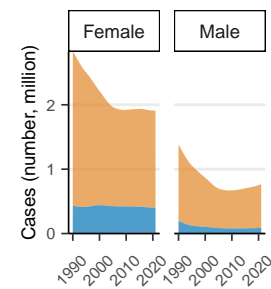
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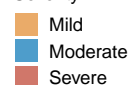
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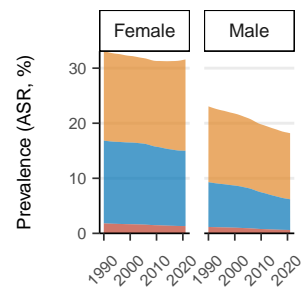
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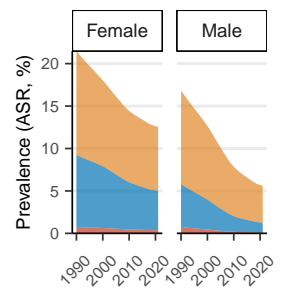
Severity

**E**

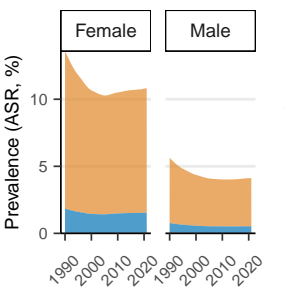
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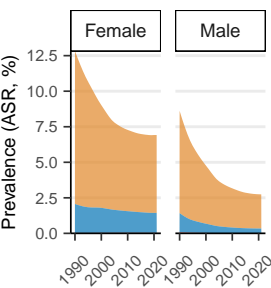
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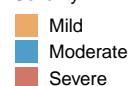
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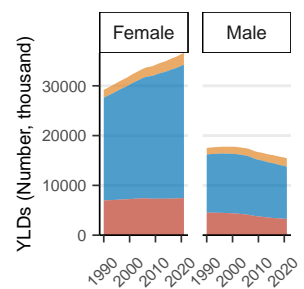
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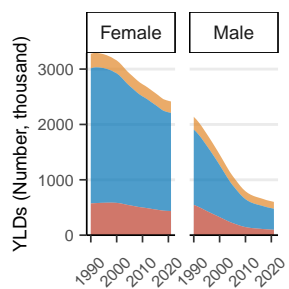
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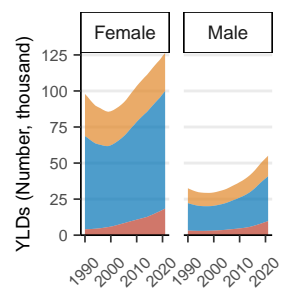
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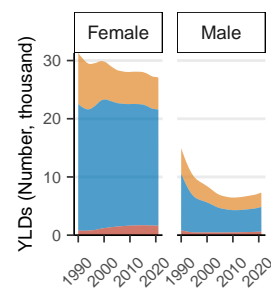
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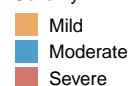
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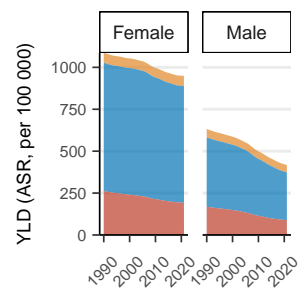
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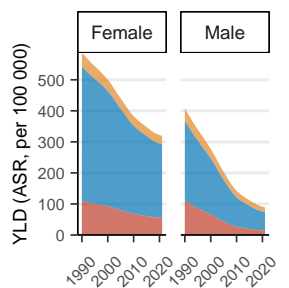
Severity

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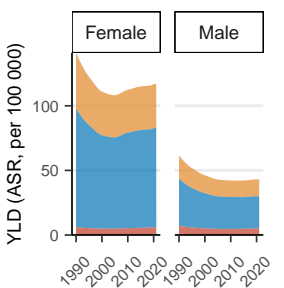
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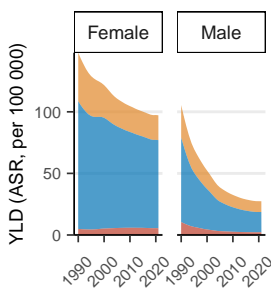
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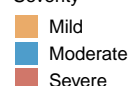
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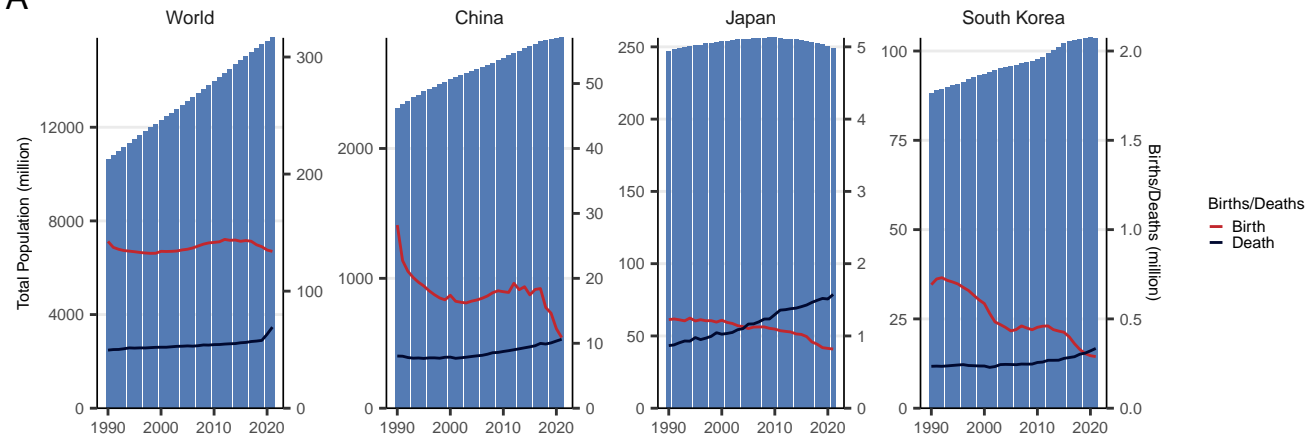
South Korea



Severity



A



B

