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Burden of digestive congenital anomalies among children aged 0-14 years in 204 countries and territories, 1990-2021: results from the Global Burden of Disease Study 2021

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Burden of digestive congenital anomalies among children aged 0-14 years in 204 countries and territories, 1990-2021: results from the Global Burden of Disease Study 2021

Background

The Burden of digestive congenital anomalies among children aged 0-14 years in the world has not been comprehensively studied. We aim to delineate the digestive congenital abnormalities burden in children under 14 years old between 1990 and 2021. It utilizes prevalence, deaths, and disability-adjusted life years (DALYs) data from the Global Burden of Disease Study (GBD) to analyze this issue.

Methods

We implemented data from GBD 2021 to collect information on the occurrence, mortality, and DALYs linked to congenital digestive abnormalities from 1990 to 2021. We present precise estimations with 95% uncertainty intervals (UIs). In addition, we computed the estimated annual percentage change (EAPC) to examine the temporal patterns of these indicators.

Results

In 2021, 2206.79 thousand prevalent cases were reported worldwide, with digestive congenital anomalies accounting for 47.16 thousand deaths and 4324.56 thousand DALYs among children aged 0-14 years. Digestive congenital anomalies mortality was mitigated by 35.35% between 1990 and 2021, with the global 0-14 years death rate declining to 0.77 per 100 000. The worldwide burden of digestive congenital abnormalities in 2021 was 4324.56 thousand DALYs, with an age-standardized rate of 70.44 DALYs per 100,000 population. This is a 34.96% hindrance compared to the year 1990. There was a significant hindrance in the prevalence, particularly among older children. The likelihood of digestive congenital abnormalities peaked during infancy (2–4 years) in all regions.

Conclusions

We highlight promising global declines in the digestive congenital anomalies burden among children over the last 34 years. Prevalence, deaths, and DALYs associated with these anomalies have shown consistent decreases, although regional variations persist. These findings offer crucial insights for shaping effective prevention and management strategies for pediatric digestive congenital anomalies.

Key words: global burden; digestive congenital anomalies; DALYs; GBD 2021; children

Introduction

Based on prior research on the Global Burden of Disease (GBD) data, congenital birth abnormalities are the fourth prevailing cause of mortality among children under the age of 5, encompassing around 10% of all deaths within this age group [1]. According to the World Health Organization (WHO), the estimated worldwide occurrence of congenital abnormalities varies between 1% and 5%, based on the region and the particular population under investigation [2]. While the overall death rate linked to congenital defects is declining, congenital malformations remain account for roughly 17% to 42% of newborn mortalities [3]. Congenital malformations in the digestive system might result in death if not promptly treated with surgery. Therefore, a

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multidisciplinary approach is necessary to ensure appropriate therapy for these disorders [4]. Typically, children who have congenital defects affecting their digestive system are prone to have delays in their development, issues with eating, and other concerns. Feeding difficulties in newborns may result from challenges in swallowing or digesting food, while delayed or mitigated gastrointestinal digestive function could cause problems, including constipation, diarrhea, and different digestive concerns. Consequently, these problems might lead to malnutrition and an inability to thrive. Moreover, surgical intervention for congenital defects affecting the digestive system might also have an influence on a child's growth and development[5].

An analysis of very underweight newborns found that the most common forms of congenital defects were associated with the digestive system (31.7%) and the heart (27.7%)[6]. Between 2008 and 2012, the European Surveillance of Congenital Anomalies (EUROCAT) reported a rate of 2.1 instances per 10,000 live births for significant congenital gastrointestinal abnormalities. Anorectal abnormalities, such as anal atresia and/or stenosis, were the most prevalent subgroup. This was followed by esophageal atresia with or without tracheoesophageal fistula, diaphragmatic hernia, Hirschsprung disease, and duodenal atresia or stenosis[7]. Gastroschisis (GS) and omphalocele (OC) are the two most often congenital abnormalities of the abdominal wall. The prevalence of GS is around 4.5 per 10,000 live births, whereas the OC incidence ranges from 0.6 to 4.8 per 10,000 live births. In contrast to other congenital anomalies, there has been an increasing occurrence of GS in recent years[8]. GS is often an isolated abnormality, and the prognosis is influenced by the overall condition of the prolapsed bowel loops. On the contrary, OC is often linked to different abnormalities encompassing chromosomal or cardiac anomalies, as well as syndromes encompassing pentalogy of Cantrell and Beckwith-Wiedemann syndrome[9]. There is a potential link between the occurrence of abdominal wall abnormalities with maternal smoking, with a positive correlation. Conversely, there is a negative correlation between the occurrence of these defects and maternal age and socioeconomic position [10].

Currently, there is only one study from South Korea on digestive congenital anomalies [11]. Currently, there is a lack of additional relevant research that provides information on the worldwide status of this disease. The GBD study is an accessible database that offers a systematic scientific evaluation of the global occurrence and implication on the life quality of 369 conditions measured in disability-adjusted life-years (DALYs)[12]. We aim to use the latest GBD dataset from 1990 to 2021 to understand the global disease burden of digestive congenital anomalies. These findings will support and strengthen the theoretical basis for personalized intervention strategies tailored to the needs of national healthcare systems and individual patients. The outcomes of our investigation will improve our comprehension of the burden and aid in the creation of efficient approaches for the prevention and management of this condition.

Methods

Study data

The statistics on congenital malformations of the digestive system from 1990 to 2021 were acquired from the Global Health Data website (https://vizhub.healthdata.org/gbd-results/). All statistics as values coupled with 95% uncertainty intervals (UI) derived from 100,000 simulations were presented with the GBD 2021 research. The data for analysis was selected based on the following selection criteria. The research period was initially established as 1990–2021. Furthermore, the location name was established to incorporate "Global," "the 21 geographic locations",

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"sociodemographic index (SDI) areas," and "the 204 countries or territories"[13]. Furthermore, the reason was determined to be "digestive congenital anomalies. " The assessment index for measuring the burden of digestive congenital abnormalities was determined to be the “prevalence,” “deaths,” and “DALYs.” Ultimately, the age variable was divided into five distinct categories: less than 1 year, 1 to 4 years, 5 to 9 years, 10 to 14 years, and 0 to 14 years.

Definitions

Age-standardized rate (ASR) [14]

ASR used the GBD 2021 global age standard population as its foundation. The ASR of this research primarily encompassed ASR of prevalence and DALYs.

Disability-adjusted life-years (DALYs)

In the GBD 2021 project, the worldwide syphilis burden was assessed with DALYs, which is a metric that integrates the number of years lived with a disability and the number of years lost [14].

Sociodemographic index (SDI)

The SDI is a composite measure that indicates the level of economic and social advancement. It is derived from factors such as education, average income, and overall fertility rate under the age of 25[15]. In the GBD 2021, countries and territories were categorized into five quintiles based on their SDI: low, low-middle, middle, high-middle, and high [16].

Estimated annual percentage change (EAPC)

The EAPC and 95% confidence intervals (CI) were determined by calculating the average annual percentage change in ASR from 1990 to 2021. An increasing trend in the ASR was determined if both the EAPC and the lower 95% CI limit were positive. On the other hand, if both the EAPC and the upper 95% CI limit were negative, the ASR was deemed to have a declining trend. However, ASR was considered to be consistently stable throughout time.

Statistical analysis

The data were obtained from the GBD database and analyzed with R software version 4.3.3 (https://www.R-project.org/). Subgroup analysis was conducted based on sex, age, SDI, 21 geographic locations, and 204 countries.

Results

Global level

In 2021, 2206.79 thousand recorded instances of digestive congenital abnormalities worldwide, as shown in Table 1. The age-standardized point prevalence was 45.09 per 100,000, which is a drop of 8.15% compared to 1990. In 2021, there were 47.16 thousand fatalities caused by digestive congenital abnormalities, with an ASR of 0.77. This is a reduction of 35.35% compared to 1990. The worldwide number of DALYs for digestive congenital abnormalities in 2021 was 4324.56 thousand, with an ASR of 70.44 DALYs per 100,000. This represents a 34.96% reduction compared to 1990 (table 1).

Table 1 | Prevalent cases, deaths, and DALYs for digestive congenital anomalies in 2021, the percentage change in age-standardized rates (ASRs) per 100000, and EAPC by Global Burden of Disease region, from 1990 to 2021 (generated from data available at https://vizhub.healthdata.org/gbd-results/)

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	Prevalence (95% UI)				Deaths (95% UI)				DALYs (95% UI)			
	No. in thousands (95% UI)	ASRs per 100 000 (95% UI)	Percentage change in ASRs from 1990 to 2021	EAPC (1990–2021) (95% UI)	No. in thousands (95% UI)	ASRs per 100 000 (95% UI)	Percentage change in ASRs from 1990 to 2021	EAPC (1990–2021) (95% UI)	No. in thousands (95% UI)	ASRs per 100 000 (95% UI)	Percentage change in ASR s from 1990 to 2021	EAPC (1990–2021) (95% UI)
Global	2206.79 (1734.74 to 2735.1)	45.09 (36.64 to 54.19)	-8.15 (-14.04 to -1.8)	-0.27 (-0.32 to -0.23)	47.16 (35.18 to 59.03)	0.77 (0.58 to 0.96)	-35.35 (-57.49 to 16.74)	-1.26 (-1.31 to -1.2)	4324.56 (3246.58 to 5390.46)	70.44 (53.14 to 87.6)	-34.96 (-57.06 to 15.48)	-1.24 (-1.29 to -1.19)
High-income Asia Pacific	24.06 (19.02 to 29.12)	48.56 (39.22 to 57.38)	-3.48 (-8.82 to 2.6)	-0.06 (-0.21 to 0.09)	0.08 (0.06 to 0.11)	0.15 (0.11 to 0.2)	-68.46 (-79.51 to -53.29)	-3.4 (-3.65 to -3.15)	8.16 (6.28 to 10.85)	14.75 (11.46 to 19.35)	-65.6 (-77.02 to -50.89)	-3.14 (-3.36 to -2.91)
High-income North America	68.6 (55.33 to 83.42)	47.04 (39.49 to 54.44)	-6.4 (-13.89 to 1.88)	-0.07 (-0.15 to 0.01)	0.41 (0.32 to 0.49)	0.22 (0.17 to 0.26)	-33.36 (-53.44 to -20.95)	-0.79 (-0.97 to -0.6)	40.1 (31.73 to 47.45)	21.68 (17.25 to 25.44)	-31.79 (-51.19 to -20.16)	-0.74 (-0.92 to -0.57)
Western Europe	78.19 (63.87 to 94.89)	51.54 (42.75 to 61.21)	-8.17 (-13.16 to -3.71)	-0.32 (-0.34 to -0.3)	0.34 (0.28 to 0.42)	0.18 (0.15 to 0.22)	-63.49 (-73.63 to -53.63)	-2.99 (-3.13 to -2.86)	34.49 (28.94 to 42.73)	18.35 (15.45 to 22.59)	-60.66 (-71.23 to -51.22)	-2.78 (-2.92 to -2.65)
Australasia	3.98 (3.11 to 4.89)	28.28 (22.96 to 33.56)	-5.94 (-15.04 to 3.87)	-0.53 (-0.63 to -0.43)	0.02 (0.02 to 0.04)	0.15 (0.11 to 0.23)	-71.45 (-78.39 to -59.18)	-3.67 (-3.96 to -3.39)	2.35 (1.83 to 3.51)	14.24 (11.25 to 21.14)	-69.76 (-76.79 to -57.84)	-3.53 (-3.79 to -3.26)
Andean Latin America	29.54 (23.13 to 37.63)	68.49 (54.93 to 83.79)	10.19 (-0.71 to 23.29)	0.27 (0.18 to 0.36)	0.59 (0.41 to 0.78)	1.01 (0.71 to 1.34)	-48.04 (-71.69 to 7.32)	-1.57 (-1.73 to -1.41)	53.93 (38.13 to 71.83)	92.32 (65.51 to 122.41)	-47.44 (-71.19 to 7.27)	-1.54 (-1.7 to -1.38)
Tropical Latin America	107.38 (86.11 to 132.64)	86.52 (70.56 to 103.38)	-7.68 (-16.5 to 2.16)	-0.25 (-0.28 to -0.21)	1.29 (1.02 to 1.64)	0.81 (0.64 to 1.01)	-21.46 (-44.19 to 8.6)	-0.16 (-0.59 to 0.27)	120.66 (95.77 to 151.6)	74.54 (59.73 to 92.91)	-21.61 (-43.62 to 6.67)	-0.19 (-0.61 to 0.23)
Central Latin America	81.46 (65.23 to 98.93)	54.26 (44.66 to 64.09)	11.16 (3.07 to 20.64)	0.32 (0.22 to 0.43)	1.89 (1.4 to 2.46)	1.03 (0.77 to 1.33)	-8.57 (-39.06 to 27.09)	0 (-0.14 to 0.14)	172.87 (128.91 to 224.32)	93.06 (69.56 to 120.37)	-8.58 (-38.73 to 26.53)	-0.01 (-0.14 to 0.13)
Southern Latin America	18.27 (14.28 to 22.31)	52.54 (42.72 to 62.11)	38.05 (22.34 to 56.25)	0.92 (0.76 to 1.08)	0.24 (0.18 to 0.3)	0.64 (0.48 to 0.8)	-33.82 (-52.08 to -12.47)	-1.15 (-1.35 to -0.95)	22.12 (16.98 to 27.67)	59.39 (45.76 to 74.21)	-32.51 (-50.78 to -11.39)	-1.1 (-1.3 to -0.9)
Caribbean	19.3 (15.23 to 24.06)	67.86 (55.53 to 81.41)	-11.15 (-18.02 to -4.66)	-0.41 (-0.48 to -0.33)	0.48 (0.28 to 0.77)	1.27 (0.75 to 2.03)	-31.65 (-54.14 to 11.32)	-1.02 (-1.2 to -0.83)	43.69 (26.14 to 69.73)	116.09 (70.06 to 184.27)	-31.12 (-53.54 to 11.44)	-0.99 (-1.17 to -0.82)
Central Europe	15.63 (12.26 to 19.01)	36.23 (29.74 to 42.78)	-16.3 (-21.91 to -9.85)	-0.56 (-0.6 to -0.53)	0.14 (0.11 to 0.18)	0.28 (0.22 to 0.35)	-74.11 (-83.17 to -61.55)	-4.24 (-4.41 to -4.08)	13.28 (10.44 to 16.54)	26.49 (20.89 to 32.86)	-72.99 (-82.12 to -60.39)	-4.12 (-4.27 to -3.96)
Eastern Europe	37.63 (29.96 to 46.25)	47.5 (38.41 to 56.18)	-7.63 (-12.38 to -2.63)	-0.29 (-0.38 to -0.21)	0.29 (0.21 to 0.38)	0.34 (0.25 to 0.45)	-72.05 (-81.14 to -58.57)	-4.65 (-5.04 to -4.26)	27.42 (20.62 to 36.02)	31.88 (24.29 to 41.44)	-71.04 (-80.14 to -57.73)	-4.54 (-4.91 to -4.16)
Central Asia	39.57 (31.18 to 49.68)	58.77 (47.54 to 70.44)	9.98 (1.59 to 18.99)	0.39 (0.34 to 0.44)	0.6 (0.48 to 0.77)	0.62 (0.49 to 0.8)	-21.41 (-40.02 to 6.22)	-0.67 (-0.99 to -0.35)	55.81 (44.31 to 71.01)	57.85 (46.1 to 73.44)	-20.36 (-38.8 to 6.4)	-0.63 (-0.93 to -0.33)
North Africa and Middle East	212.13 (167.12 to 262.39)	50.57 (40.88 to 59.51)	-10.55 (-18.88 to -2.04)	-0.41 (-0.46 to -0.37)	4.2 (2.87 to 5.52)	0.74 (0.5 to 0.97)	-62.97 (-78.95 to -10.76)	-2.96 (-3.04 to -2.88)	385.82 (268.91 to 506.2)	67.85 (47.56 to 88.75)	-62.35 (-78.36 to -10.86)	-2.91 (-2.99 to -2.83)
South Asia	470.43 (364.27 to 595.31)	39.49 (31.32 to 48.78)	-11.43 (-20.06 to -1.83)	-0.32 (-0.4 to -0.25)	9.51 (5.32 to 15.99)	0.64 (0.37 to 1.08)	-34.19 (-63.5 to 49.35)	-1.11 (-1.22 to -1)	875.77 (498.39 to 1459.05)	58.84 (33.86 to 97.43)	-33.89 (-63.13 to 47.19)	-1.1 (-1.21 to -0.99)
Southeast Asia	169.27 (133.05 to 209.26)	40.47 (32.89 to 48.29)	-2.48 (-11.28 to 7.3)	-0.14 (-0.18 to -0.09)	3.3 (2.19 to 4.52)	0.62 (0.41 to 0.85)	-31.27 (-59.27 to 61)	-1.25 (-1.33 to -1.17)	303.11 (203.61 to 413.26)	56.7 (38.26 to 77.26)	-30.64 (-58.62 to 58.94)	-1.22 (-1.3 to -1.14)
East Asia	277.1 (209.16 to 345.5)	40.06 (31.76 to 48.82)	-10.47 (-20.82 to 3.17)	-0.2 (-0.29 to -0.12)	2.45 (1.53 to 3.64)	0.43 (0.27 to 0.64)	-65.73 (-84.05 to -19.77)	-3.9 (-4.08 to -3.72)	232.39 (148.76 to 340.92)	40.15 (25.59 to 59.03)	-64.86 (-83.36 to -19.65)	-3.81 (-3.98 to -3.63)
Oceania	5.3 (4.08 to 6.75)	41.59 (33.21 to 51.15)	7.53 (-1.71 to 19.49)	0.18 (0.08 to 0.27)	0.06 (0.02 to 0.14)	0.29 (0.11 to 0.71)	-4.73 (-43.78 to 55.25)	-0.15 (-0.34 to 0.04)	5.44 (2.14 to 13.12)	28.02 (11.77 to 65.82)	-4.07 (-41.76 to 51.97)	-0.13 (-0.31 to 0.05)
Western Sub-Saharan Africa	269.66 (207.96 to 334.32)	48.18 (38.88 to 57.8)	-4.58 (-11.78 to 3.72)	-0.26 (-0.35 to -0.17)	12.74 (7.89 to 17.46)	1.58 (1.01 to 2.17)	-20.1 (-44.56 to 76.76)	-0.39 (-0.5 to -0.27)	1151.28 (718.89 to 1575.46)	140.99 (88.96 to 192.78)	-20.05 (-44.28 to 76.91)	-0.38 (-0.5 to -0.27)
Eastern Sub-Saharan Africa	194.24 (152.15 to 242.44)	43.2 (35.14 to 52.54)	-17.39 (-24.99 to -8.04)	-0.6 (-0.66 to -0.53)	6.52 (3.51 to 10.59)	1.02 (0.59 to 1.66)	-39.48 (-65.46 to 59.58)	-1.3 (-1.43 to -1.18)	592 (325.22 to 955.78)	92.69 (52.8 to 148.72)	-39.22 (-64.98 to 56.04)	-1.29 (-1.41 to -1.17)
Central Sub-Saharan Africa	61.89 (48.28 to 78.81)	42.45 (34.53 to 51.86)	-18.82 (-29.16 to -6.85)	-0.76 (-0.85 to -0.67)	1.62 (0.86 to 2.83)	0.78 (0.43 to 1.36)	-50.4 (-71.5 to 25.5)	-2.07 (-2.21 to -1.93)	148.02 (79.98 to 256.28)	71.28 (39.19 to 122.63)	-50.1 (-70.99 to 21.87)	-2.06 (-2.2 to -1.92)
Southern Sub-Saharan Africa	23.17 (18.29 to 28.69)	41.74 (33.86 to 49.87)	2.48 (-4.34 to 11.58)	0.14 (0 to 0.27)	0.39 (0.21 to 0.62)	0.52 (0.29 to 0.83)	-18.18 (-47.53 to 15.54)	-0.61 (-0.75 to -0.48)	35.85 (20.28 to 56.53)	47.51 (27.27 to 74.32)	-18.12 (-46.68 to 14.53)	-0.61 (-0.74 to -0.48)

95% UI=95% uncertainty intervals.

Regional level

In 2021, Tropical Latin America (86.52), Andean Latin America (68.49), and Caribbean (67.86) possessed the greatest age-standardized point prevalence for digestive congenital anomalies (per 100000), whereas Australasia（28.28）, Central Europe (36.23), and South Asia (39.49) had the lowest (table 1). Western Sub-Saharan Africa (1.58), Caribbean (1.27), and Central Latin America (1.03) experienced the greatest age-standardized death rates from digestive congenital anomalies in 2021, with the lowest rates in High-income Asia Pacific (0.15), Australasia (0.15), and Western Europe (0.18) (table 1). In 2021, Western Sub-Saharan Africa (140.99), Caribbean (116.09), and Central Latin America (93.06) experienced the greatest age-standardized DALYs per 100,000. On the other hand, Australasia (14.24), High-income Asia Pacific (14.75), and Western Europe (18.35) had the lowest rate (table 1). Tables S1-S3 show the age-standardized point prevalence, mortality, and DALY rates of digestive congenital abnormalities, respectively, categorized by gender in the year 2021. These tables include data from all regions and countries that comprise the GBD research. The prevalence, deaths, and DALY rates due to digestive congenital anomalies have shown a decreasing trend across all regions and countries worldwide.

The largest decreases in the age-standardized point prevalence of digestive congenital anomalies from 1990 to 2021 were found in Central Sub-Saharan Africa (-18.82%), Eastern Sub-Saharan Africa (-17.39%), and Central Europe (-16.3%), with the greatest increases in Southern Latin America (38.05%), Central Latin America (11.16%), and Andean Latin America (10.09%) (table 1). In the same period, all regions showed a decrease in the age-standardized death rates from digestive congenital anomalies, with the largest decreases in Central Europe (−74.11%), central Europe (−72.05%), and Australasia (−71.45%) (table 1). The age-standardized DALYs decreased in all regions from 1990 to 2021, with the largest decreases in Central Europe (−72.99%), Eastern Europe (−71.04%), and Australasia (−69.76%) (table 1).

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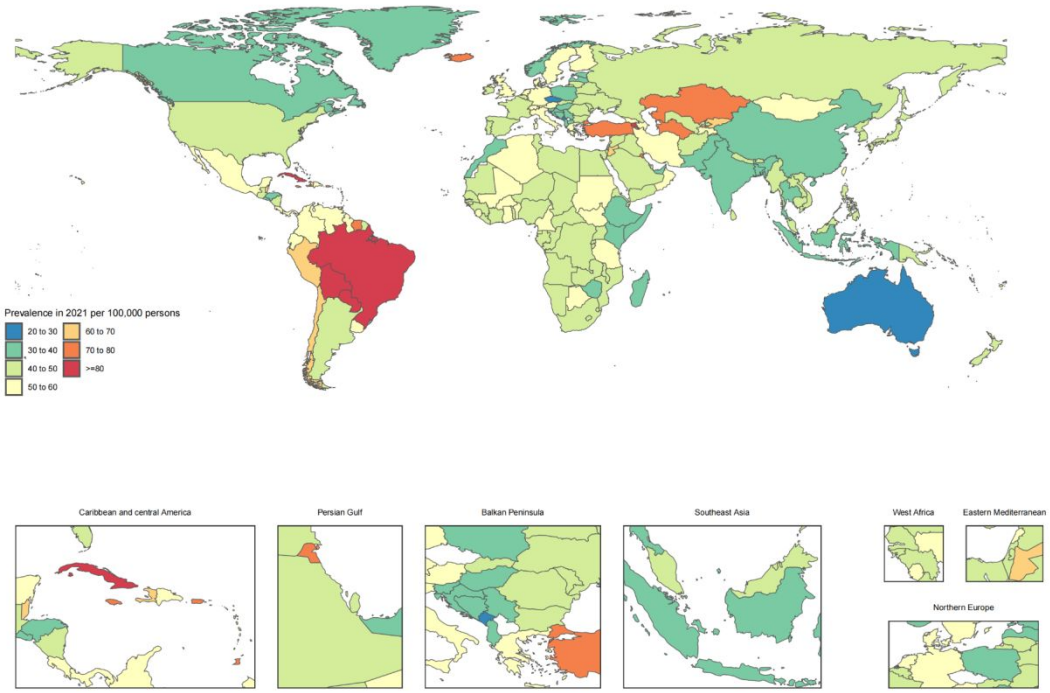

Fig 1 | Age-standardized point prevalence of digestive congenital anomalies per 100 000 population in 2021 by country (generated from data available at https://vizhub.healthdata.org/gbd-results/)

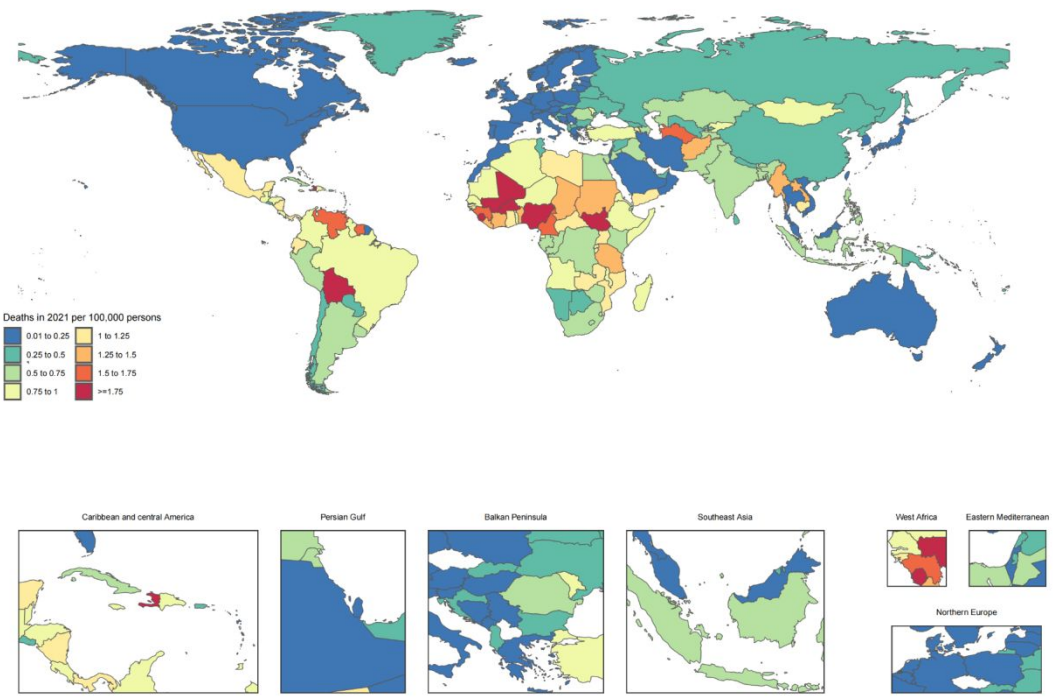

Fig 2 | Age-standardized death rate of digestive congenital anomalies per 100 000 population in

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2021 by country (generated from data available at https://vizhub.healthdata.org/gbd-results/)

National level

In 2021, the national age-standardized point prevalence of digestive congenital anomalies spanned from 36.6 to 54.2 instances per 100000. Brazil (86.7), Tropical Latin America (86.5), and the Plurinational State of Bolivia (86.2) possessed the greatest age-standardized point prevalences of digestive congenital anomalies, with Australia (24.6), Czech Republic (27.8), and Montenegro (29.1) having the lowest estimates (fig 1 and table S1). In 2021, the national age-standardized mortality rates for digestive congenital abnormalities ranged from 0.6 to 1 death per 100,000 people. The highest rates were seen in Burkina Faso (2.0), Haiti (1.9), Bolivia (1.8), Mali (1.8), Nigeria, Sierra Leone (1.8), South Sudan (1.8), and Suriname (1.7), whereas the lowest rates were found in Northern Mariana Islands (0.05), Estonia (0.1), Andorra (0.1), and Luxembourg (0.1) (fig 2 and table S2). In 2021, the national age-standardized DALYs of digestive congenital anomalies ranged from 53.1 to 87.6 patients per 100000. The highest rates were seen in Cambodia (99.1), Uganda (97.4), and Ecuador (97.2), whereas the lowest rates were in Guam (10.0), Tonga, and Czechia (10.2). (table S3). The age-standardized point prevalence had significant variations in percentage change from 1990 to 2021 across different countries. Notably, Turkmenistan, Seychelles, and Chile had the highest increases, with percentages of 48.1%, 44.2%, and 40.9% respectively. On the other hand, the Democratic People's Republic of Korea, Ethiopia, and Estonia experienced the largest hindrances, with percentages of -29.2%, -28.95%, and -28.2%, respectively (table S1). Tokelau, Niue, and Guatemala exhibited the most increases in the age-standardized death rate over the same time, with percentages of 226.3%, 182.5%, and 103.8%, respectively. Conversely, Iran, Estonia, and Czechia had the biggest declines in the death rate, with percentages of -88.3%, -87.8%, and -87.2% respectively (table S2). Tokelau (209.4%), Niue (169.9%), and Guatemala (103.4%) had the largest increases in age-standardized DALY rate of DACs from 1990 to 2021. In contrast, the greatest decreases during the study period were found in Iran (−87.3%), Czechia (−85.8%), and Estonia (−85.6%) (table S3).

Age and sex patterns

In 2021, the point occurrence of digestive congenital abnormalities started to rise in the <1 year group worldwide, with the highest incidence observed in children aged 2-4 years. Likewise, the number of existing instances was most abundant in the 2-4 years age group but thereafter declined as age increased. The prevalence was greater in males across all age groups (figure 3).

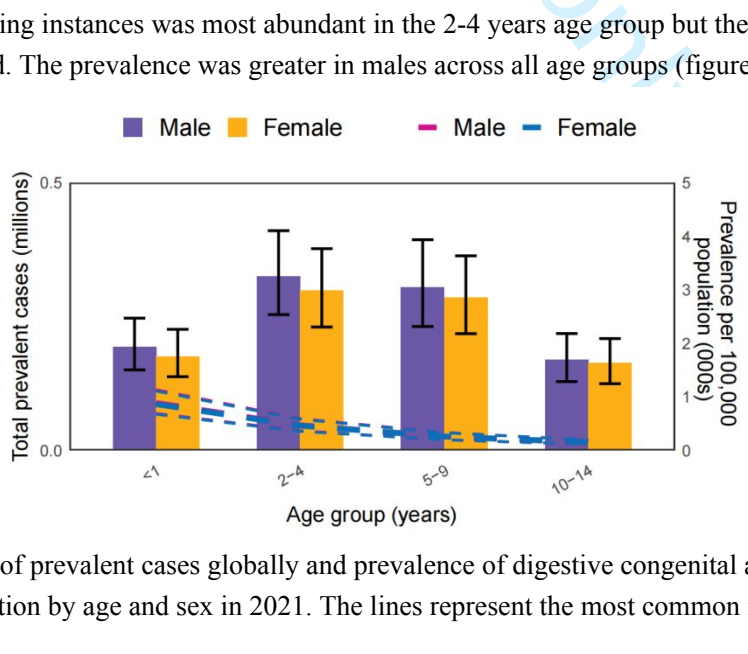

Fig 3 | Number of prevalent cases globally and prevalence of digestive congenital anomalies per 100,000 population by age and sex in 2021. The lines represent the most common instance, along

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with a 95% range of uncertainty, for both men and women (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Association with the SDI

We observed a horizontal S-shaped connection between the SDI and the age-standardized DALYs of digestive congenital abnormalities at the regional level, spanning from 1990 to 2021. The age-standardized DALYs exhibited exponential growth as the SDI climbed, reaching a peak at around 0.4, before which they declined. From 1990 to 2021, Western Sub-Saharan Africa, North Africa, the Middle East, and Eastern Sub-Saharan Africa experienced a larger number of DALYs than what was anticipated based on their SDI. Conversely, Australasia, High-income North America, High-income Asia Pacific, and Western Europe had lower-than-anticipated burdens from 1990 to 2021 (fig 4).

In 2021, the digestive congenital abnormalities burdens declined as socioeconomic development increased at the country level until reaching a SDI of around 0.25. However, after that point, the prevalence started to fall again until reaching an SDI of about 0.6 (fig S1). Several countries and territories, including Burkina Faso, Mali, South Sudan, and Chad, had much larger burdens than anticipated. Conversely, the Northern Mariana Islands, Estonia, and Andorra had considerably lower burdens than projected (fig S1).

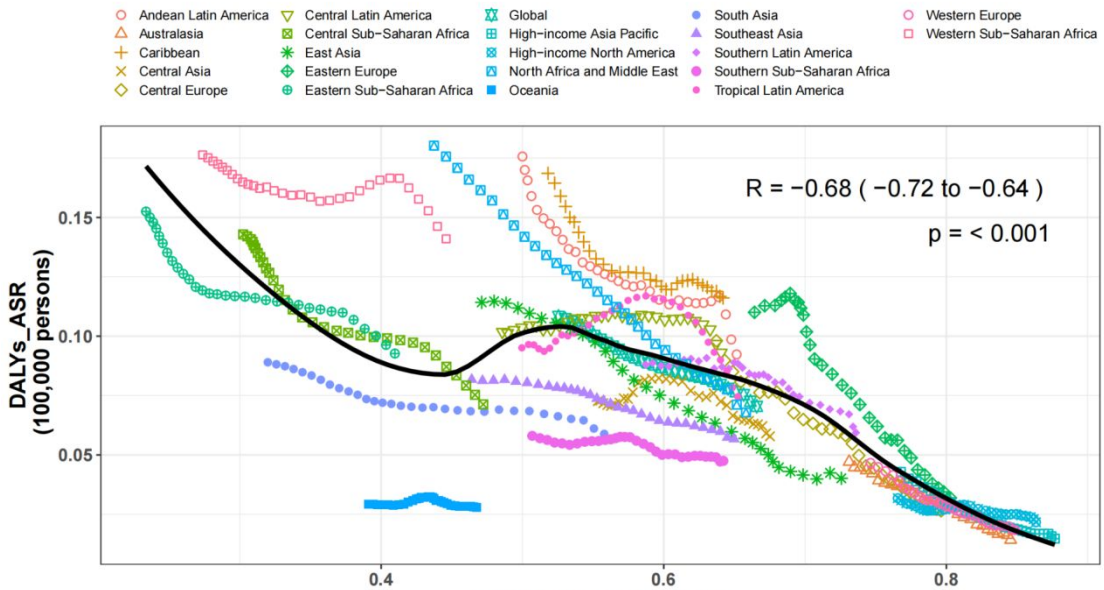

Fig 4 | Age-standardized DALYs of digestive congenital anomalies for the 21 Global Burden of Disease regions by SDI, 1990–2021. Each region is represented by thirty-two data points, which display the age-standardized DALYs recorded from 1990 to 2021 for that specific region. The solid line represents the expected values, which are determined by considering the SDI and disorder rates in all areas. (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Discussion

Digestive congenital anomalies worldwide constitute a broad topic involving medical, public health, and societal issues. These malformations refer to structural abnormalities in the digestive system present at birth, which can affect the development and function of organs such as the esophagus, stomach, small intestine, large intestine, anus, and other related organs[17], including

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conditions like esophageal atresia [18], biliary atresia [19], and Hirschsprung disease [20].

The incidence of digestive congenital anomalies in children varies significantly worldwide, attributed in part to interactions among genetic, environmental, and nutritional factors. Regarding genetic factors, chromosomal abnormalities such as Down syndrome are associated with higher rates of upper gastrointestinal tract malformations[21]. Gene mutations are also associated with Hirschsprung disease [22]. Environmental factors such as exposure to drugs and toxins, such as certain medications and chemicals, can increase the risk of malformations. Research has shown that maternal exposure to drugs during pregnancy[23], such as antidepressants, can lead to digestive congenital anomalies [24]. Maternal exposure to pesticides or active/passive smoking during pregnancy can also increase the risk of birth defects [25]. Some studies indicate that pesticide exposure throughout pregnancy is a risk factor for neuroblastoma in infants [26, 27]. Infections during pregnancy, particularly viral infections like cytomegalovirus, rubella virus, Zika virus, and others in early pregnancy, can potentially cause fetal malformations [28]. Research has shown that maternal infections during pregnancy can increase the risk of biliary atresia [29]. Nutritional factors also play a crucial role, with maternal malnutrition, such as folate deficiency, being linked to neural tube defects and congenital heart diseases[30]. A prospective investigation in Norway demonstrated that prenatal supplementation with folic acid and multivitamins can reduce the incidence of infant abdominal wall defects[31].

In developed countries, advancements in preventive measures and medical technology have significantly improved the ability to diagnose and treat congenital malformations, leading to higher survival rates among affected children[32]. However, in some developing countries, these medical conditions are poorer, leading to significant global disparities between North and South. These differences are evident not only in incidence and mortality rates but also in patient prognosis and quality of life. Treating congenital digestive tract malformations is typically a complex process requiring multidisciplinary collaboration, including pediatrics, surgery, nutrition, and rehabilitation medicine. Early diagnosis and treatment are crucial for improving the life quality and increasing survival rates of impacted children[33], whereas delayed treatment may result in long-term malnutrition, developmental delays, and other complications. With advancements in technology and increased global health awareness, there has been growing attention and research focused on digestive congenital anomalies. Driven by global health agendas, many countries and organizations are committed to improving child health, particularly in the early detection and treatment of congenital diseases.

Conclusions

In summary, according to our study of the GBD 2021 database, the prevalence, deaths, and DALYs of digestive congenital anomalies in the global population aged 0-14 years are generally declining, reflecting ongoing progress worldwide. Digestive congenital anomalies worldwide represent a complex and diverse issue that requires attention and support from society as a whole. The technological advancements and the formulation of public health policies via international collaboration, we can provide better treatment and management for patients, thereby improving their quality of life.

Abbreviations

DALYs: Disability-adjusted life years

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GBD: Global burden of disease
SDI: Socio-demographic index
EAPC: Estimated annual percentage changes
ASR: Age-standardized rate
CI: Confidence interval
UI: Uncertainty intervals

Ethics approval and consent to participate

The research involving people did not need ethical clearance since it complied with local law and institutional regulations. Participants and their legal guardians/next of kin were not needed to provide written informed permission to participate in this research, as per national law and institutional standards.

Consent for publication

Not applicable.

Availability of data and materials

Herein, we investigated datasets that are accessible to the public. The data is available from the following source: The Global Burden of Disease (GBD) Study 2021, accessible at http://ghdx.healthdata.org.

Competing interests

None of the authors declares a conflict of interest.

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Author contributions

Xi Luo and Jie Luo contributed equally to this study. Jinhua Zhao, Jun Du, and Xu Sun designed the study. Xi Luo and Jie Luo gathered the data. Xi Luo and Jie Luo examined the data. Xi Luo wrote the manuscript. Huajian Gu and Deqin Lu contributed significant intellectual input and gave their approval for the final version to be published. Every author made contributions to the paper and gave their approval to the submitted version.

Acknowledgments

Not applicable.

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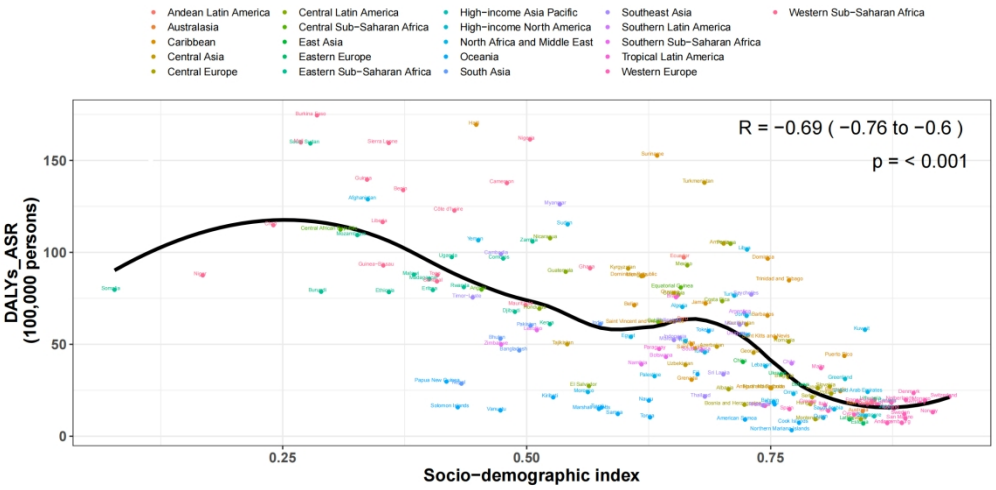

figureS1

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BMJ Open: first published as 10.1136/bmjopen-2024-093902 on 23 December 2024. Downloaded from http://bmjopen.bmj.com/ on June 13, 2025 at Agence Bibliographique de l Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.

Table S1: Prevalence due to digestive congenital anomalies in 19 the age-standardised rates (ASRs) per 10 (Generated from data available from http://ghdx.hea	1990	
	No(95%UI)	ASRs per 100 000 (95%UI)
Global	2239346 (1714221,2784993)	49.1 (39,59.2)
Andean Latin America	23552	62.2 (49.9,75)
Ecuador	4205 (3212,5493)	43.3 (34,53.9)
Peru	12989 (9803,16767)	62.1 (48.8,76.1)
Australasia	3657 (2885,4543)	30.1 (24,36.6)
Australia	2577 (2024,3297)	25.4 (20.1,31.4)
New Zealand	1080 (846,1340)	52.2 (41.9,63.2)
Caribbean	23657	76.4 (61.6,92.4)
Antigua and Barbuda	22 (17,27)	50.5 (39.9,61.6)
Barbados	103 (79,129)	67.5 (53.6,81.5)
Belize	143 (111,181)	65.4 (51.9,78.5)
Bermuda	17 (13,21)	58.9 (46,72.6)
Cuba	7005 (5524,8742)	98.9 (79.7,120.3)
Dominica	33 (25,40)	54.5 (42.9,64.9)
Dominican Republic	4902 (3775,6171)	67.1 (53.5,82.3)
Grenada	41 (31,52)	50.4 (39.9,61.2)
Guyana	444 (339,559)	58.1 (47,70.4)
Haiti	5639 (4168,7170)	73.6 (56.3,90.1)
Jamaica	1631 (1250,2059)	74.3 (58.8,91.4)
Puerto Rico	1647 (1279,2060)	68.4 (54.3,83.4)
Saint Kitts and Nevis	19 (15,24)	55.8 (44.2,67.6)
Saint Lucia	72 (56,91)	56.6 (45.5,69.3)
Saint Vincent and the Grenadines	58 (44,73)	58 (46.2,70.9)
Suriname	271 (210,336)	78.1 (62.2,94.8)
Trinidad and Tobago	656 (500,834)	65.5 (50.9,80.7)
United States Virgin Islands	49 (39,61)	63.5 (50.9,75.4)
Central Asia	34122	53.4 (42.7,64.5)
Armenia	2429 (1883,3030)	82.5 (65.5,100.7)
Azerbaijan	3294 (2476,4189)	53.3 (42,66.3)
Georgia	1500 (1143,1884)	47.8 (37.9,57.9)
Kazakhstan	10096 (7732,12797)	73.5 (57.7,88.9)
Kyrgyzstan	2864 (2141,3652)	62.5 (48.2,77.3)
Mongolia	1351 (1039,1728)	56.3 (45.4,69.3)
Tajikistan	2756 (2073,3540)	45 (35.6,55)
Turkmenistan	2161 (1631,2737)	54 (43.2,66.8)
Uzbekistan	7672 (5786,9729)	38.5 (30.4,47.6)
Central Europe	33544	43.3 (34.7,52)
Albania	816 (615,1049)	28.8 (22.5,36.7)
Bosnia and Herzegovina	928 (698,1152)	33.7 (26.6,40.9)
Bulgaria	2481 (1897,3058)	58 (46,70.2)
Croatia	894 (725,1115)	36.7 (30,44.4)
Hungary	2443 (1909,3060)	45.5 (36.5,55.9)

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Montenegro	175 (133,224)	42.2 (33.1,51.5)
North Macedonia	580 (440,722)	41.9 (32.8,51.5)
Poland	10181 (7626,12961)	38 (29.4,47.8)
Romania	7316 (5603,9262)	49.8 (39.7,61.8)
Serbia	2901 (2236,3643)	51 (40.5,62.6)
Slovakia	1375 (1051,1713)	40.8 (32,49.3)
Slovenia	516 (393,646)	49 (38.8,59.9)
Central Latin America	81036	48.8 (39.4,58.7)
Colombia	14619	49.1 (39.5,59.9)
Costa Rica	1770 (1386,2220)	56.7 (45.3,69.5)
El Salvador	1671 (1248,2111)	33.3 (26.4,40.7)
Guatemala	3620 (2680,4725)	35.8 (28.1,44.5)
Honduras	1669 (1264,2134)	31.7 (24.8,38.7)
Mexico	45653	52.6 (41.9,62.9)
Nicaragua	2295 (1755,2860)	46.9 (36.8,57.6)
Panama	1092 (848,1369)	49.3 (39.2,60.7)
Central Sub-Saharan Africa	37525	52.3 (40.5,64.4)
Angola	6646 (4967,8475)	49.3 (37.8,61.4)
Central African Republic	1700 (1275,2210)	49.8 (38.9,61.4)
Congo	1354 (1024,1715)	48.8 (38.5,59.1)
Democratic Republic of the Congo	26968	53.5 (41.8,65.9)
Equatorial Guinea	253 (187,317)	46.2 (35.5,56.6)
Gabon	604 (458,753)	54.2 (42.5,66.7)
East Asia	401675 (299906,509493)	44.7 (34.5,55.3)
China	383719 (286325,487662)	44.1 (33.9,54.7)
Democratic People's Republic of Korea	9352 (7101,11757)	56.8 (44.7,70.1)
Taiwan (Province of China)	8603 (6768,10687)	68 (55.1,81.8)
Eastern Europe	68360	51.4 (41.5,62.1)
Belarus	3094 (2321,3940)	49.7 (38.9,60.3)
Estonia	374 (285,470)	42.6 (33.1,51.6)
Latvia	539 (406,684)	39 (30.1,47.8)
Lithuania	1022 (792,1305)	47.2 (37,59)
Republic of Moldova	1692 (1297,2143)	51.9 (41.1,63.4)
Russian Federation	49812	55.3 (44.1,66.6)
Ukraine	11827 (9139,15057)	41.3 (32.8,51.4)
Eastern Sub-Saharan Africa	132853 (99934,168819)	52.3 (40.6,63.7)
Burundi	4301 (3162,5554)	56.7 (43.7,70.4)
Comoros	297 (223,384)	51.2 (39.9,63.6)
Djibouti	223 (166,282)	48 (38,58.8)
Eritrea	1936 (1459,2440)	45.5 (35.3,55.3)
Ethiopia	35635	51.7 (39.8,63.6)
Kenya	12491 (9456,15620)	42.9 (33.4,52)
Madagascar	7828 (5809,9943)	51.9 (40.8,64.3)
Malawi	7759 (5777,10017)	58 (44.2,72.6)
Mozambique	8931 (6681,11358)	52.2 (39.8,65)
Rwanda	5114 (3833,6474)	53.8 (41.8,66.9)
Somalia	5043 (3786,6365)	47.4 (36.7,58.8)

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South Sudan	4024 (2978,5211)	55.2 (42.6,68.1)
Uganda	12418 (9253,15979)	51.1 (39.7,62.7)
United Republic of Tanzania	20630	59.7 (46.3,74.1)
Zambia	6128 (4601,7695)	57.2 (44,70.6)
High-income Asia Pacific	43454	50.3 (40.9,60.6)
Brunei Darussalam	81 (62,105)	35.1 (28,43.8)
Japan	31249	54.7 (44.3,65.4)
Republic of Korea	11265 (8754,14527)	41.8 (33.5,52.4)
Singapore	858 (676,1084)	50.4 (39.9,62.4)
High-income North America	71282	50.3 (40.1,59.6)
Canada	3829 (3069,4841)	26.2 (21.4,32.3)
Greenland	14 (11,18)	36.1 (28.4,44.4)
United States of America	67437	52.8 (42.1,62.5)
North Africa and Middle East	208416 (160683,254990)	56.5 (44.3,68.2)
Afghanistan	6495 (4844,8358)	53.8 (42,66.2)
Algeria	15028	53.5 (42.7,65)
Bahrain	243 (187,304)	56.6 (45.1,68.8)
Egypt	24564	44.1 (34.5,53.8)
Iraq	12022 (9215,15303)	54.2 (42.8,66.6)
Jordan	2580 (1987,3246)	58.3 (45.3,71.9)
Kuwait	1117 (873,1390)	76 (61.1,91.7)
Lebanon	1567 (1188,2025)	56.2 (43.9,69.3)
Libya	2486 (1949,3098)	54.3 (43.4,66.5)
Morocco	10176 (7640,13025)	41.9 (32.1,52)
Oman	1010 (769,1249)	45.7 (36.2,55.7)
Palestine	1445 (1088,1821)	52.9 (41.8,65.3)
Qatar	154 (116,191)	48.1 (37.7,58.3)
Saudi Arabia	8229 (6284,10302)	48.1 (37.9,58.3)
Sudan	13146 (9849,16560)	53 (40.7,64.4)
Syrian Arab Republic	8295 (6055,10637)	53 (40.7,65.2)
Tunisia	4705 (3539,5905)	57.6 (45.3,70.8)
Turkey	41667	79.1 (62.7,98.1)
United Arab Emirates	823 (622,1023)	48.8 (38.1,58.9)
Yemen	8647 (6569,11060)	45.2 (35.5,55.7)
Oceania	2522 (1936,3119)	38.7 (30.7,47.1)
American Samoa	15 (11,18)	35.8 (28.7,43.7)
Cook Islands	6 (4,7)	39.5 (30.6,49.1)
Fiji	233 (178,297)	37.2 (29.4,46)
Guam	32 (24,41)	35 (27.5,42.7)
Kiribati	31 (24,40)	42.6 (33.2,52.7)
Marshall Islands	16 (12,21)	32.9 (26.2,40.2)
Northern Mariana Islands	10 (8,13)	38.4 (30.6,47.2)
Papua New Guinea	1682 (1280,2103)	39.3 (31.5,48.5)
Samoa	68 (52,85)	41.9 (32.8,51.5)
Solomon Islands	127 (95,164)	35.3 (27.8,42.9)
Tokelau	0 (0,1)	34.3 (27.4,42.6)
Tonga	34 (26,42)	36.7 (29.4,44.6)
Tuvalu	4 (3,5)	42.4 (33.2,52.4)
Vanuatu	52 (40,67)	33.1 (26.6,40.7)

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South Asia	506338 (380124,644021)	44.6 (34.7,54.6)
Bangladesh	64517	48.1 (37.3,59.6)
Bhutan	338 (253,428)	48.7 (37.5,60.1)
India	381100 (286564,483734)	44.8 (34.9,54.9)
Nepal	10204 (7637,13205)	45.2 (35.1,55.2)
Pakistan	50179 (37357,63935)	39.9 (31.4,49)
Southeast Asia	185939 (142078,233199)	41.5 (32.6,50.1)
Cambodia	5714 (4265,7489)	43.7 (33.7,54.8)
Indonesia	67916	37.4 (29.3,45.6)
Lao People's Democratic Republic	2501 (1909,3202)	48.4 (37.9,60.7)
Malaysia	6215 (4791,7771)	37.2 (29.4,45.4)
Maldives	152 (117,192)	50.4 (39.4,62.5)
Mauritius	358 (280,446)	43.4 (34.9,52.7)
Myanmar	16939	44.1 (34.3,54.8)
Philippines	34359	52.3 (41.1,62.9)
Seychelles	22 (17,28)	38.8 (30.3,47.4)
Sri Lanka	5745 (4324,7280)	41.6 (32.7,51)
Thailand	17606	42.3 (32.7,51.5)
Timor-Leste	404 (301,515)	42.5 (33,52.2)
Southern Latin America	15239	38.1 (31.1,46.5)
Uruguay	877 (672,1095)	40.6 (32,49.6)
Argentina	9253 (7445,11625)	34.1 (28,41.5)
Chile	5109 (3998,6445)	47.1 (38,58.3)
Southern Sub-Saharan Africa	20289	40.7 (32.6,49.5)
Botswana	603 (465,761)	47.2 (37.8,57.9)
Lesotho	654 (501,839)	41.5 (32.4,50.8)
Namibia	559 (434,710)	40 (32,48.9)
South Africa	13188	39.9 (31.8,48.4)
Zimbabwe	4851 (3661,6234)	42.7 (34.1,52.5)
Tropical Latin America	128208 (98858,157914)	93.7 (75,112.9)
Brazil	125366 (96699,154412)	94.6 (75.9,114.1)
Paraguay	2842 (2148,3501)	68.3 (54.3,83.2)
Western Europe	93081 (76409,111656)	56.1 (46.6,65.7)
Andorra	14 (10,17)	64.2 (51.1,77.7)
Austria	2286 (1871,2795)	71.3 (58.8,84.2)
Belgium	2385 (1941,2909)	56 (46.9,66.8)
Cyprus	279 (213,350)	60 (47.8,72.7)
Denmark	1241 (1001,1503)	58.2 (47.6,69.2)
Finland	1522 (1208,1865)	66.9 (55.1,80.5)
France	13205	48.2 (40.8,56.7)
Germany	16325	53 (44,63)
Greece	2556 (2008,3221)	57.4 (46.6,70.1)
Iceland	116 (90,150)	76.6 (60.5,93.8)

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Ireland	1227 (1017,1473)	55.2 (46.5,65.3)
Israel	1554 (1212,1963)	43.1 (34.9,52.4)
Italy	11848 (9463,14379)	58.9 (48,69.1)
Luxembourg	78 (60,98)	50.5 (40.5,61.3)
Malta	138 (111,176)	66.9 (55.3,82.9)
Netherlands	4242 (3430,5161)	65.2 (54.6,78.3)
Norway	1373 (1090,1680)	64 (51.7,76.3)
Portugal	2276 (1802,2857)	47.7 (38.9,58.2)
Spain	7155 (6011,8693)	42.2 (35.8,50)
Sweden	3052 (2413,3818)	74.8 (60,92.2)
Switzerland	2037 (1632,2506)	72.2 (60.4,86.9)
United Kingdom	18085	66.9 (53.5,80.1)
Western Sub-Saharan Africa	124600 (94094,158114)	50.5 (39.3,61.6)
Benin	3744 (2815,4687)	54.5 (42.9,65.9)
Burkina Faso	7075 (5259,9076)	52.7 (40.5,64.7)
Cameroon	7084 (5251,9027)	52.7 (40.2,64.8)
Chad	3937 (2891,5147)	47.1 (36.1,59.1)
Ghana	8184 (6130,10189)	46 (36,55.7)
Guinea	4277 (3203,5505)	53.4 (41.5,66.2)
Guinea-Bissau	690 (520,889)	52 (40.4,64.2)
Liberia	1968 (1468,2513)	60 (46.6,75.5)
Mali	6178 (4601,8036)	52.1 (40,64.6)
Mauritania	1165 (874,1470)	47.6 (36.5,57.8)
Niger	5643 (4164,7279)	50 (37.8,61.5)
Nigeria	54781 (41648,69871)	49.7 (38.9,60.7)
Sao Tome and Principe	86 (65,112)	56.6 (43.6,70.1)
Senegal	5223 (3872,6618)	51.6 (40.2,63.2)
Sierra Leone	3233 (2387,4157)	59 (44.7,73.2)
Togo	2312 (1760,2990)	48.8 (37.9,61.3)
Federated States of Micronesia	41 (32,52)	40 (32.1,48.9)
Socialist Republic of Viet Nam	27737	40 (32.1,48.4)
Czech Republic	2401 (1857,3011)	43.2 (34.1,53)
Islamic Republic of Iran	43903	64.9 (51.3,78.1)
Kingdom of Eswatini	434 (332,541)	47.6 (37.8,58.3)
Republic of Coate d'Ivoire	8210 (6034,10689)	51.4 (39.5,63.3)
Commonwealth of the Bahamas	104 (81,130)	55.3 (43.9,66.1)
Plurinational State of Bolivia	6358 (4725,7767)	89.7 (70.6,107.9)
Republic of Palau	4 (3,5)	39.8 (31.6,48.2)
Bolivarian Republic of Venezuela	8648 (6620,11067)	47 (37.6,57.8)
Republic of Cabo Verde	215 (159,271)	50.5 (38.9,62.6)
Republic of the Gambia	589 (440,749)	46.7 (36.9,57.3)
Republic of Niue	1 (1,1)	39.2 (31.1,48.5)
Republic of Nauru	4 (3,5)	39.1 (31.3,47.3)
Republic of San Marino	5 (4,7)	58.6 (46.7,71.3)
Principality of Monaco	4 (3,5)	48.9 (39,59.6)

95% UI=95% uncertainty intervals.

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90 and 2021 and the percentage change in 0,000, by location althdata.org/gbd-results-tool)		
2021		Percentage change in the ASRs per 100 000
No(95%UI)	ASRs per 100 000 (95%UI)	
2206787 (1734739,2735104)	45.1 (36.6,54.2)	-8.2 (-14,-1.8)
29545	68.5 (54.9,83.8)	10.2 (-0.7,23.3)
7531 (5867,9497)	60 (47.7,73.4)	38.5 (22.5,57.5)
15003	66.7 (53.6,82.5)	7.4 (-7.8,26.7)
3981 (3112,4889)	28.3 (23,33.6)	-5.9 (-15,3.9)
2879 (2243,3613)	24.6 (19.7,29.6)	-3.2 (-15.8,10.3)
1102 (881,1327)	46.3 (38.4,54.1)	-11.5 (-20.2,-1.2)
19296	67.9 (55.5,81.4)	-11.2 (-18,-4.7)
21 (16,26)	54.3 (44.1,65.8)	7.5 (-6.1,22.3)
80 (63,100)	73.1 (58.9,89)	8.3 (-5.8,25)
182 (142,230)	63.6 (50.8,77.1)	-2.6 (-15.1,14.2)
9 (7,11)	51.6 (41.5,62.2)	-12.3 (-23.2,-1.1)
3583 (2736,4573)	83.4 (66.2,102.8)	-15.7 (-28.1,-1.8)
20 (16,26)	67.8 (53.5,83.5)	24.4 (8.8,39.9)
4260 (3266,5447)	58.5 (45.9,71.8)	-12.7 (-25.4,-0.1)
25 (19,30)	51.2 (40.7,61)	1.7 (-11.3,16.9)
302 (237,381)	58.6 (47.2,71.3)	0.7 (-12.9,15.6)
7555 (5826,9416)	65.4 (53.2,79.1)	-11.2 (-23.5,3.6)
968 (757,1192)	70.8 (56.7,84.7)	-4.7 (-16.1,9.5)
705 (553,886)	74.8 (59.8,91)	9.4 (-3,25.3)
13 (10,16)	57 (45.2,69.6)	2.2 (-9.5,16.4)
39 (30,49)	58.3 (46.3,70.4)	2.9 (-8.9,18.2)
33 (26,42)	59.5 (47.9,72)	2.6 (-11.8,19.7)
265 (209,324)	75.5 (61,90.7)	-3.3 (-16.5,11)
477 (373,596)	75 (61,90.1)	14.4 (0,30.7)
16 (13,20)	58.1 (46.7,70.1)	-8.6 (-20.1,3.6)
39566	58.8 (47.5,70.4)	10 (1.6,19)
1126 (870,1399)	80.2 (63.8,96.3)	-2.9 (-16.8,14.1)
2943 (2257,3854)	55.1 (44.3,68.2)	3.3 (-9.8,17.3)
922 (742,1129)	53.7 (44.1,63.5)	12.4 (-4.5,32)
10062 (7821,12766)	76.3 (61.2,91.9)	3.7 (-9.1,17.9)
3602 (2820,4604)	62.7 (50.8,78)	0.3 (-13.8,17.3)
1501 (1148,1948)	55 (43.3,67.8)	-2.4 (-16.3,11.3)
5587 (4243,7205)	57.4 (45.3,70.8)	27.4 (12.5,45)
3239 (2469,4087)	79.9 (63.2,98)	48.1 (30.5,67.2)
10585 (8297,13491)	46.1 (37.4,56.5)	19.7 (4.5,39.5)
15626	36.2 (29.7,42.8)	-16.3 (-21.9,-9.9)
409 (312,503)	37.6 (29.6,45.3)	30.6 (13.7,50.4)
351 (265,443)	31.2 (24.6,38.1)	-7.3 (-18,5.5)
1066 (825,1342)	48.3 (39,58.5)	-16.7 (-26.8,-4.2)
540 (420,682)	37.7 (30.2,45.9)	2.6 (-12.1,18.9)
1167 (911,1459)	34.4 (27.1,41.6)	-24.6 (-33.7,-14.1)

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72 (55,91)	29.1 (22.7,35.4)	-30.9 (-39,-21.6)
289 (227,364)	36.7 (29.7,44.5)	-12.4 (-24.3,1.4)
4793 (3798,5859)	31.1 (25.5,37.2)	-18.1 (-25.5,-9)
3410 (2662,4177)	45.9 (37,55)	-8 (-23.1,10.1)
1072 (827,1357)	39.2 (31,48)	-23.2 (-35.4,-8)
897 (704,1111)	41.3 (33.4,49.8)	1.3 (-11.7,18.2)
234 (176,291)	33.1 (25.6,39.9)	-32.5 (-42.3,-19.2)
81462	54.3 (44.7,64.1)	11.2 (3.1,20.6)
15290	59.5 (48.7,71.6)	21 (8.9,36.9)
1344 (1062,1651)	55.4 (44.8,66.4)	-2.3 (-14.1,12.6)
1411 (1078,1792)	35.2 (27.7,43)	5.5 (-7.9,19.8)
4874 (3896,6065)	43.7 (35.5,52.4)	22.1 (3.8,45.1)
2546 (1993,3179)	35.2 (28.5,42.8)	11.2 (-1,24.2)
42443	56.6 (46.3,66.8)	7.8 (-1.2,18.8)
2290 (1773,2910)	47.3 (37.6,57.3)	0.8 (-12.6,15.2)
1514 (1177,1890)	53.2 (42.6,64.5)	7.9 (-5.1,23.7)
61894	42.4 (34.5,51.9)	-18.8 (-29.2,-6.8)
17793	45.9 (37.1,54.9)	-6.9 (-20,8.8)
2689 (2067,3423)	45.2 (36.3,55.1)	-9.3 (-19.9,3)
1925 (1472,2498)	42.9 (34,52.8)	-12.1 (-24.7,3.4)
38121	40.7 (32.5,50.8)	-23.9 (-36.4,-10.8)
649 (482,824)	48.7 (37.9,59.6)	5.3 (-10.6,22.6)
717 (547,912)	47.7 (37.9,58.8)	-11.9 (-23.9,0.6)
277096 (209157,345501)	40.1 (31.8,48.8)	-10.5 (-20.8,3.2)
269030 (202773,335797)	39.8 (31.4,48.6)	-9.8 (-20.6,4.5)
4429 (3353,5463)	40.2 (31.8,48.7)	-29.2 (-38.7,-18.5)
3637 (2971,4296)	58.1 (49.7,66.9)	-14.6 (-23.8,-2.9)
37627	47.5 (38.4,56.2)	-7.6 (-12.4,-2.6)
1395 (1097,1739)	40.4 (32.5,48.6)	-18.7 (-29.4,-6.1)
128 (99,162)	30.6 (24.3,37.1)	-28.2 (-36.2,-17.7)
195 (151,245)	32.8 (26.6,39.7)	-15.9 (-26.8,-5.3)
392 (306,481)	42.6 (34.5,51.6)	-9.9 (-21.9,4.4)
553 (425,689)	47 (37.2,56.5)	-9.5 (-22.4,4.4)
28678	49.1 (39.6,57.7)	-11.2 (-15.4,-6.5)
6286 (4887,7995)	45 (36.5,54.9)	9 (-6.8,24.8)
194241 (152150,242440)	43.2 (35.1,52.5)	-17.4 (-25,-8)
6513 (5031,8222)	43.5 (34.7,53.2)	-23.3 (-34,-11.4)
261 (198,335)	45 (35.5,55.5)	-12.2 (-24.1,1)
491 (380,605)	47.4 (38.3,56.8)	-1.3 (-14.3,13.1)
2557 (1983,3171)	40.8 (32.9,49.2)	-10.3 (-22,3.7)
40762	36.8 (29.8,44.5)	-28.9 (-37.1,-18.6)
15622	36.4 (28.8,44.2)	-15.1 (-21.8,-7.9)
10934 (8340,14202)	38.7 (30.6,48)	-25.4 (-35.7,-12.3)
8955 (7077,11156)	45.4 (36.9,55.3)	-21.6 (-34.9,-6.5)
15961	44.4 (35.7,55.8)	-15 (-27.4,-0.6)
6069 (4636,7616)	48.3 (38.6,58.8)	-10.2 (-22.8,5.1)
10775 (8153,13591)	39.3 (31.4,47.8)	-17.1 (-27.6,-6.1)

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5577 (4182,7189)	50 (39.2,62.7)	-9.4 (-21,1.6)
24746	48.3 (39.2,58.5)	-5.6 (-16.2,9)
34702	54.2 (43.2,66.8)	-9.3 (-21.4,7)
10146 (7863,12910)	49.1 (39.3,60.2)	-14.1 (-25.8,0.5)
24057	48.6 (39.2,57.4)	-3.5 (-8.8,2.6)
102 (78,125)	46.5 (37.8,55.5)	32.5 (15.5,52.8)
17263	49.2 (39.8,58.1)	-10 (-13.9,-4.7)
5795 (4456,7137)	46.6 (36.8,56.6)	11.3 (-3.5,28.9)
898 (689,1114)	47.5 (37.8,57.2)	-5.8 (-19.7,6.8)
68601	47 (39.5,54.4)	-6.4 (-13.9,1.9)
4924 (3829,6097)	32.5 (26.2,39.5)	24.1 (8.4,44.9)
10 (8,12)	33.7 (27.1,41.1)	-6.5 (-17.4,6.6)
63666	48.6 (40.9,56.2)	-7.9 (-15.2,0.5)
212134 (167125,262386)	50.6 (40.9,59.5)	-10.6 (-18.9,-2)
16724	45.3 (36.9,55.5)	-15.9 (-27.3,-1.5)
16851	52 (41.6,63.5)	-2.8 (-15,13)
293 (225,377)	45.5 (36.8,56)	-19.6 (-32.5,-6.2)
36296	44.5 (34.9,53.4)	0.9 (-11.7,14.3)
13426	44.6 (35.4,54.2)	-17.8 (-28.5,-6.8)
5404 (4083,6963)	63.1 (50.3,78.2)	8.2 (-8.3,26.5)
1550 (1193,1963)	78 (62.3,94.9)	2.6 (-10.7,18.3)
1525 (1156,1915)	51.9 (41.5,62.6)	-7.6 (-21.7,7.1)
1540 (1205,1889)	49.9 (40.4,60)	-8.1 (-19,4.3)
8601 (6558,10593)	39.8 (31.7,48.2)	-4.9 (-17.8,10)
1459 (1118,1830)	51.1 (41.1,61.8)	12 (-4.1,28.2)
1800 (1393,2269)	42.3 (33.6,51.6)	-20.1 (-31.7,-8.3)
507 (385,630)	47.4 (37.8,57.3)	-1.5 (-15.4,16.9)
7441 (5734,9388)	48.6 (38.8,58.8)	1.1 (-9.7,14.3)
20929	51.6 (41.8,62.9)	-2.8 (-17.3,12.9)
3419 (2619,4333)	44.3 (34.9,54)	-16.5 (-29.8,-2.3)
2968 (2299,3769)	47.6 (38.3,58.2)	-17.3 (-29.3,-2.3)
32266	76.4 (61.9,92.7)	-3.4 (-19,14)
1184 (906,1513)	39.2 (31,47.9)	-19.8 (-30.4,-5.7)
13715	41.5 (33.5,50.2)	-8.4 (-20.7,3.9)
5296 (4082,6753)	41.6 (33.2,51.1)	7.5 (-1.7,19.5)
10 (7,12)	36 (28.9,43.5)	0.4 (-11.5,13.4)
3 (2,4)	39 (31.2,47.3)	-1.2 (-11.7,12)
273 (211,349)	44.3 (35.5,54.5)	18.9 (2.3,37.5)
36 (28,45)	44.8 (35.5,53.8)	28.2 (11.5,45)
40 (30,50)	42.5 (33.5,51.8)	-0.2 (-11.5,14)
13 (10,17)	35.6 (28.7,42.8)	8.1 (-5.8,23.1)
10 (7,12)	42.4 (33.6,51.6)	10.5 (-2.9,24.8)
4239 (3205,5477)	41.8 (33.1,51.8)	6.4 (-4.6,22)
64 (48,81)	36.6 (29.1,44.6)	-12.7 (-25.2,0.3)
214 (165,270)	37.5 (30.2,45.7)	6.2 (-9.1,20.1)
0 (0,0)	35.5 (28.3,43.1)	3.4 (-9.7,15.6)
34 (26,42)	39.4 (31.8,47.5)	7.5 (-4.3,20.2)
3 (2,4)	36.3 (29,43.9)	-14.3 (-26.5,1)
91 (70,114)	34.9 (27.9,41.7)	5.4 (-6.6,22.2)

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470433 (364266,595313)	39.5 (31.3,48.8)	-11.4 (-20.1,-1.8)
42134	40 (31.8,50.5)	-16.9 (-28.8,-2.9)
207 (157,261)	46.6 (36.6,57.4)	-4.3 (-17.3,11.1)
339527 (261225,429491)	39.7 (31.4,48.7)	-11.3 (-19.8,-1.3)
8621 (6591,11170)	40.1 (31.6,50)	-11.3 (-26.2,3.4)
79943 (61268,101421)	38.8 (30.8,48.1)	-2.8 (-14.5,8.3)
169267 (133052,209263)	40.5 (32.9,48.3)	-2.5 (-11.3,7.3)
5271 (4108,6688)	42.1 (33.8,51.2)	-3.6 (-17.8,14.1)
55858	34.3 (27.4,41.1)	-8.4 (-18,2.1)
2476 (1920,3197)	42.4 (33.8,53.3)	-12.3 (-26.5,2.4)
7372 (5635,9292)	41.7 (32.9,51.4)	12.1 (-3.4,29.1)
106 (82,133)	44.1 (34.3,52.7)	-12.6 (-23.2,1.6)
264 (211,331)	53.1 (43.1,64.4)	22.1 (7.2,39)
18271	46.6 (37.5,56.2)	5.7 (-9.7,22.5)
40781	48.8 (39.9,57.9)	-6.8 (-14.3,2)
33 (26,41)	55.9 (45.5,68)	44.2 (25.7,65.9)
4948 (3758,6282)	41.6 (32.5,50.7)	-0.1 (-13.5,15.2)
6776 (5137,8578)	33 (26.1,40.3)	-22 (-35.3,-5.5)
466 (357,588)	36.8 (29,44.2)	-13.4 (-26.2,2.7)
18270	52.5 (42.7,62.1)	38 (22.3,56.3)
823 (646,1038)	53.3 (42.6,65.2)	31.1 (16.7,49.2)
11742 (9009,14546)	47.3 (37.7,56.8)	38.4 (16.4,62.6)
5704 (4450,6940)	66.3 (53.8,78.1)	40.9 (23,62.6)
23168	41.7 (33.9,49.9)	2.5 (-4.3,11.6)
821 (632,1034)	55.2 (43.4,66.6)	16.9 (1.6,34.5)
577 (437,735)	42.8 (34.1,52.3)	3 (-11.5,18)
777 (598,979)	42.4 (33.9,51.6)	6.2 (-6.4,20.2)
14939	42 (34.1,49.9)	5.4 (-2.4,16)
5623 (4378,7240)	40 (32.3,48.4)	-6.4 (-16.6,5.3)
107376 (86108,132636)	86.5 (70.6,103.4)	-7.7 (-16.5,2.2)
103458 (82937,127949)	86.7 (70.7,103.5)	-8.3 (-17.3,2)
3918 (3017,4942)	81.3 (65.1,99.5)	19.1 (3.8,36)
78193 (63870,94889)	51.5 (42.8,61.2)	-8.2 (-13.2,-3.7)
9 (7,12)	47.7 (38.3,57.5)	-25.7 (-35,-14.8)
1659 (1314,2082)	59.6 (48.7,71)	-16.5 (-25.2,-6.2)
2043 (1645,2551)	49.6 (41,59.6)	-11.4 (-22.3,0)
204 (159,255)	45.7 (36.6,55)	-23.9 (-34.1,-11.6)
1131 (900,1410)	51.7 (42,61.7)	-11.1 (-21.5,0.3)
904 (689,1162)	52.7 (42,64.4)	-21.2 (-31.2,-10.3)
12539	48.5 (40.6,57.9)	0.7 (-10.5,12.2)
13725	50.6 (41.5,62)	-4.4 (-17.5,9.2)
1696 (1329,2134)	55.2 (45.2,67.9)	-3.8 (-14.7,9.2)
103 (80,127)	71.9 (57.8,87.1)	-6.1 (-17.2,7.4)

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922 (740,1140)	44.4 (36,53.4)	-19.5 (-29.6,-9.2)
2474 (1926,3093)	42 (33,50.8)	-2.7 (-14.5,11.9)
9774 (7787,12124)	56.4 (46.4,67.6)	-4.2 (-11.7,2.6)
84 (66,104)	41.1 (33.3,50)	-18.6 (-27.7,-7.2)
108 (85,139)	70 (56.1,85.3)	4.6 (-7.7,17.6)
3503 (2775,4503)	59.1 (48.5,72.2)	-9.4 (-20.7,4.5)
809 (626,999)	38.4 (31,45.8)	-40 (-44.2,-35.9)
1268 (993,1567)	43.7 (35.4,51.8)	-8.5 (-19.8,5.4)
5781 (4734,6906)	41.4 (34.8,48.8)	-1.9 (-14.6,11.5)
2304 (1805,2846)	55.7 (44.5,66.6)	-25.5 (-33.5,-16.7)
1722 (1355,2167)	58.6 (47.7,71.9)	-18.9 (-31,-4.8)
15352	58.6 (46.8,68.9)	-12.5 (-19.9,-4.7)
269658 (207960,334316)	48.2 (38.9,57.8)	-4.6 (-11.8,3.7)
8761 (6710,11069)	53.6 (42.8,64.8)	-1.6 (-13.7,10.6)
16689	56.9 (44.5,68.9)	8.1 (-3.7,22.2)
18129	53 (42.9,64.4)	0.5 (-13.3,15.9)
10423 (7841,13351)	43.3 (34.5,52.7)	-8 (-18.5,4.6)
16426	50.7 (40.4,61.1)	10.1 (-3.1,25.3)
7685 (5813,9635)	48.5 (38.3,58.9)	-9.2 (-20.8,4)
908 (693,1162)	40.6 (32.5,49.7)	-21.9 (-34.7,-8.2)
2300 (1760,2914)	44 (34.9,53.4)	-26.7 (-37.5,-13.7)
15909	51.3 (40.1,62.9)	-1.4 (-14.2,14.1)
1865 (1428,2403)	42.4 (33.3,51.7)	-11 (-23.4,2.8)
15022	44.4 (35,54.4)	-11.2 (-22.5,0.9)
124412 (96137,154792)	47 (37.9,56.9)	-5.4 (-12.6,2.9)
90 (71,114)	48.8 (39,59.3)	-13.8 (-26.8,3.7)
6955 (5447,8707)	44 (35.1,52.8)	-14.8 (-25.4,-1.3)
5356 (3945,6792)	54.8 (42.8,67.8)	-7.1 (-19.8,7.3)
3320 (2529,4195)	41.8 (33.7,50.5)	-14.4 (-27.4,-1.3)
23 (17,29)	36.3 (29.5,44.5)	-9.3 (-21.1,5.6)
26408	43.8 (35.2,53.4)	9.6 (-5.1,23.8)
1099 (846,1362)	27.8 (22.3,33.2)	-35.7 (-43.8,-26.1)
24040	51.8 (41.8,61.7)	-20.1 (-28.4,-9.9)
431 (333,549)	47 (37.4,57.4)	-1.2 (-14.9,15)
14282	48.3 (38.9,58.4)	-6.1 (-19.2,10.1)
89 (70,112)	53.2 (43.3,64.2)	-3.8 (-13.3,9.7)
7010 (5379,8869)	86.2 (69.1,104.3)	-3.9 (-19.6,11.8)
3 (2,3)	41 (32.9,49)	3 (-8.6,15.8)
9750 (7585,12134)	58.2 (46.7,71.7)	23.9 (6.8,47.2)
153 (116,195)	46.5 (36.6,57.3)	-7.9 (-19.9,5.4)
968 (752,1218)	40.5 (32.7,48.9)	-13.3 (-25.2,-0.3)
0 (0,1)	48.4 (38.9,58.6)	23.3 (8.1,40.4)
4 (3,5)	44.1 (35.5,53.7)	12.8 (-0.7,27.5)
5 (4,6)	51.8 (41.1,63)	-11.5 (-21.2,-0.9)
4 (3,5)	40.7 (32.9,49.6)	-16.8 (-26.2,-7.3)

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Table S2: Deaths due to digestive congeni the age-standardise (Generated from data available	19
	No(95%UI)
Global	74386 (41045,115974)
Andean Latin America	1061 (549,1715)
Ecuador	124 (100,163)
Peru	591 (283,993)
Australasia	76 (67,94)
Australia	62 (53,79)
New Zealand	14 (11,16)
Caribbean	781 (446,1288)
Antigua and Barbuda	0 (0,0)
Barbados	2 (1,2)
Belize	3 (3,4)
Bermuda	0 (0,0)
Cuba	141 (97,172)
Dominica	0 (0,1)
Dominican Republic	203 (106,315)
Grenada	0 (0,1)
Guyana	15 (10,19)
Haiti	312 (104,736)
Jamaica	29 (21,39)
Puerto Rico	20 (16,24)
Saint Kitts and Nevis	0 (0,0)
Saint Lucia	1 (1,2)
Saint Vincent and the Grenadines	1 (1,2)
Suriname	10 (5,15)
Trinidad and Tobago	13 (10,17)
United States Virgin Islands	1 (0,1)
Central Asia	731 (567,923)
Armenia	75 (43,105)
Azerbaijan	71 (37,122)
Georgia	22 (13,32)
Kazakhstan	167 (115,215)
Kyrgyzstan	84 (53,109)
Mongolia	84 (40,159)
Tajikistan	54 (30,86)
Turkmenistan	63 (41,85)
Uzbekistan	111 (76,202)
Central Europe	896 (671,1162)
Albania	16 (9,25)
Bosnia and Herzegovina	12 (6,19)
Bulgaria	56 (45,74)
Croatia	22 (18,26)
Hungary	62 (48,72)
Montenegro	2 (1,4)

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North Macedonia	25 (11,46)
Poland	251 (195,310)
Romania	292 (178,411)
Serbia	67 (33,109)
Slovakia	23 (17,33)
Slovenia	6 (5,7)
Central Latin America	2617 (2250,3255)
Colombia	449 (374,552)
Costa Rica	42 (35,51)
El Salvador	56 (27,89)
Guatemala	76 (57,114)
Honduras	125 (75,187)
Mexico	1395 (1197,1753)
Nicaragua	167 (87,278)
Panama	39 (32,49)
Central Sub-Saharan Africa	1828 (441,3562)
Angola	355 (66,769)
Central African Republic	101 (21,221)
Congo	54 (18,97)
Democratic Republic of the Congo	1289 (317,2413)
Equatorial Guinea	11 (3,23)
Gabon	18 (6,33)
East Asia	14305 (7586,26087)
China	13985 (7382,25636)
Democratic People's Republic of Korea	256 (142,408)
Taiwan (Province of China)	64 (50,73)
Eastern Europe	1748 (1391,2061)
Belarus	67 (49,86)
Estonia	5 (4,7)
Latvia	11 (8,14)
Lithuania	25 (20,30)
Republic of Moldova	80 (50,118)
Russian Federation	1213 (974,1411)
Ukraine	347 (259,441)
Eastern Sub-Saharan Africa	6763 (1546,13941)
Burundi	202 (37,426)
Comoros	15 (4,31)
Djibouti	8 (3,16)
Eritrea	78 (18,162)
Ethiopia	1794 (373,3956)
Kenya	460 (175,874)
Madagascar	351 (89,728)
Malawi	474 (94,1000)
Mozambique	608 (115,1354)
Rwanda	266 (45,556)
Somalia	221 (46,504)
South Sudan	199 (35,455)
Uganda	551 (106,1157)
United Republic of Tanzania	1183 (247,2527)
Zambia	348 (73,734)

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High-income Asia Pacific	433 (337,553)
Brunei Darussalam	1 (1,2)
Japan	264 (215,333)
Republic of Korea	154 (88,235)
Singapore	13 (10,17)
High-income North America	702 (644,892)
Canada	70 (61,90)
Greenland	1 (0,1)
United States of America	631 (580,796)
North Africa and Middle East	10247 (3586,20166)
Afghanistan	518 (95,1282)
Algeria	675 (281,1244)
Bahrain	4 (2,7)
Egypt	1799 (440,3791)
Iraq	417 (128,807)
Jordan	92 (53,141)
Kuwait	18 (13,23)
Lebanon	51 (17,105)
Libya	97 (50,163)
Morocco	265 (100,518)
Oman	17 (7,32)
Palestine	38 (19,64)
Qatar	2 (1,4)
Saudi Arabia	212 (101,356)
Sudan	1067 (162,3268)
Syrian Arab Republic	306 (117,625)
Tunisia	176 (67,337)
Turkey	2370 (655,4601)
United Arab Emirates	22 (12,38)
Yemen	650 (138,1716)
Oceania	32 (11,72)
American Samoa	0 (0,0)
Cook Islands	0 (0,0)
Fiji	2 (1,4)
Guam	0 (0,1)
Kiribati	0 (0,1)
Marshall Islands	0 (0,0)
Northern Mariana Islands	0 (0,0)
Papua New Guinea	23 (6,59)
Samoa	0 (0,1)
Solomon Islands	1 (1,3)
Tokelau	0 (0,0)
Tonga	0 (0,1)
Tuvalu	0 (0,0)
Vanuatu	1 (0,1)
South Asia	15567 (6691,28626)
Bangladesh	2322 (663,5330)
Bhutan	10 (3,25)
India	11268 (5174,20116)
Nepal	228 (74,448)

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Pakistan	1739 (651,3415)
Southeast Asia	5205 (2407,9411)
Cambodia	331 (82,733)
Indonesia	1931 (754,3493)
Lao People's Democratic Republic	158 (23,401)
Malaysia	64 (34,124)
Maldives	5 (1,12)
Mauritius	7 (5,9)
Myanmar	1006 (243,2312)
Philippines	977 (556,1657)
Seychelles	1 (0,1)
Sri Lanka	94 (55,154)
Thailand	232 (121,389)
Timor-Leste	21 (5,52)
Southern Latin America	484 (394,618)
Uruguay	29 (22,35)
Argentina	328 (253,433)
Chile	128 (108,150)
Southern Sub-Saharan Africa	470 (324,597)
Botswana	9 (4,15)
Lesotho	13 (7,20)
Namibia	11 (6,18)
South Africa	348 (246,456)
Zimbabwe	81 (38,142)
Tropical Latin America	1624 (1325,2058)
Brazil	1586 (1296,2006)
Paraguay	38 (22,62)
Western Europe	1082 (909,1408)
Andorra	0 (0,0)
Austria	26 (22,34)
Belgium	24 (20,32)
Cyprus	3 (1,6)
Denmark	26 (17,34)
Finland	17 (13,21)
France	173 (145,218)
Germany	175 (139,261)
Greece	22 (18,34)
Iceland	1 (1,1)
Ireland	14 (12,17)
Israel	24 (19,34)
Italy	174 (134,195)
Luxembourg	0 (0,1)
Malta	2 (2,3)
Netherlands	48 (41,61)
Norway	16 (7,19)
Portugal	43 (36,56)
Spain	89 (76,119)
Sweden	28 (18,33)
Switzerland	28 (18,38)
United Kingdom	146 (127,211)

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Western Sub-Saharan Africa	7735 (2414,12224)
Benin	214 (69,348)
Burkina Faso	489 (127,850)
Cameroon	416 (136,678)
Chad	192 (56,324)
Ghana	406 (156,624)
Guinea	334 (80,583)
Guinea-Bissau	41 (12,67)
Liberia	172 (31,326)
Mali	593 (238,1044)
Mauritania	51 (18,83)
Niger	372 (79,693)
Nigeria	3331 (938,5403)
Sao Tome and Principe	4 (1,5)
Senegal	254 (85,395)
Sierra Leone	280 (60,528)
Togo	109 (45,161)
Federated States of Micronesia	0 (0,1)
Socialist Republic of Viet Nam	369 (148,592)
Czech Republic	48 (36,59)
Islamic Republic of Iran	1446 (662,2496)
Kingdom of Eswatini	8 (5,12)
Republic of Coate d'Ivoire	444 (151,686)
Commonwealth of the Bahamas	1 (1,1)
Plurinational State of Bolivia	346 (126,674)
Republic of Palau	0 (0,0)
Bolivarian Republic of Venezuela	266 (216,321)
Republic of Cabo Verde	8 (4,12)
Republic of the Gambia	24 (10,36)
Republic of Niue	0 (0,0)
Republic of Nauru	0 (0,0)
Republic of San Marino	0 (0,0)
Principality of Monaco	0 (0,0)

95% UI=95% uncertainty intervals.

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ital anomalies in 1990 and 2021 and the percentage change in
d rates (ASRs) per 100,000, by location
e from http://ghdx.healthdata.org/gbd-results-tool)

90	2021		Percentage change in the ASRs per 100 000
ASRs per 100 000 (95%UI)	No(95%UI)	ASRs per 100 000 (95%UI)	
1.2 (0.7,1.9)	47156 (35183,59027)	0.8 (0.6,1)	-35.3 (-57.5,16.7)
1.9 (1,3.1)	586 (411,782)	1 (0.7,1.3)	-48 (-71.7,7.3)
0.9 (0.7,1.2)	161 (116,217)	1.1 (0.8,1.4)	19.1 (-21.3,73)
2 (0.9,3.3)	215 (123,326)	0.7 (0.4,1)	-65.1 (-84.4,-13.7)
0.5 (0.5,0.6)	24 (19,37)	0.1 (0.1,0.2)	-71.5 (-78.4,-59.2)
0.5 (0.4,0.7)	19 (14,31)	0.1 (0.1,0.2)	-72.6 (-80.1,-59.8)
0.5 (0.4,0.6)	5 (4,7)	0.2 (0.1,0.2)	-65.6 (-74.8,-52.5)
1.9 (1.1,3.1)	478 (280,769)	1.3 (0.7,2)	-31.6 (-54.1,11.3)
0.3 (0.2,0.5)	0 (0,0)	0.3 (0.2,0.4)	-16.2 (-37.2,11.6)
0.8 (0.6,1)	1 (1,1)	0.7 (0.5,1)	-13.7 (-42.9,24.5)
1.2 (0.8,1.5)	3 (2,4)	0.8 (0.6,1)	-34.5 (-52.6,-7.7)
0.5 (0.3,0.7)	0 (0,0)	0.2 (0.1,0.4)	-45.3 (-68.2,-11.6)
1.7 (1.2,2.1)	25 (20,32)	0.5 (0.4,0.7)	-68.5 (-77.1,-53.3)
0.5 (0.3,0.8)	0 (0,0)	1 (0.6,1.6)	101 (24,215.7)
1.9 (1,3)	96 (51,186)	0.9 (0.5,1.8)	-50.7 (-77.4,-2.4)
0.4 (0.3,0.7)	0 (0,0)	0.3 (0.2,0.5)	-19.9 (-42.9,18.7)
1.2 (0.9,1.5)	6 (4,9)	0.8 (0.6,1.2)	-31.1 (-56.3,2.8)
2.7 (0.9,6.4)	299 (126,564)	1.9 (0.8,3.5)	-31.4 (-58.7,41)
1.1 (0.8,1.4)	12 (9,17)	0.8 (0.5,1.1)	-28 (-53.5,8.9)
0.6 (0.5,0.8)	4 (3,5)	0.5 (0.3,0.6)	-28.4 (-49.8,-4.6)
0.8 (0.6,1)	0 (0,0)	0.6 (0.4,0.8)	-24.8 (-46,7.6)
0.7 (0.5,1)	0 (0,1)	0.5 (0.3,0.8)	-26.1 (-54.6,19)
1.1 (0.8,1.5)	0 (0,1)	0.7 (0.5,0.9)	-41.8 (-60.8,-10.3)
2.4 (1.3,3.4)	7 (4,10)	1.7 (1.1,2.5)	-29.3 (-58.5,18)
1.2 (0.9,1.5)	7 (5,9)	0.9 (0.6,1.2)	-21.8 (-48.2,15.7)
0.5 (0.3,0.9)	0 (0,0)	0.2 (0.1,0.5)	-65.6 (-86.2,-28.3)
0.8 (0.6,1)	601 (475,770)	0.6 (0.5,0.8)	-21.4 (-40,6.2)
2.1 (1.2,2.9)	19 (13,25)	1.1 (0.8,1.5)	-45.4 (-63.2,-10)
0.8 (0.4,1.4)	33 (19,56)	0.5 (0.3,0.9)	-36.2 (-67.6,25.3)
0.5 (0.3,0.8)	10 (7,14)	0.5 (0.3,0.7)	-9.6 (-46.4,67.2)
1 (0.7,1.2)	125 (90,176)	0.7 (0.5,0.9)	-31.9 (-55.5,-2)
1.3 (0.8,1.7)	74 (59,92)	1 (0.8,1.2)	-25.8 (-49.4,14.9)
2.5 (1.2,4.7)	35 (22,49)	1 (0.6,1.3)	-61.4 (-81.3,-13.9)
0.6 (0.3,0.9)	71 (35,132)	0.5 (0.3,1)	-4.2 (-53.1,123.2)
1.1 (0.7,1.4)	79 (47,117)	1.5 (0.9,2.2)	40.8 (-5.3,104.4)
0.3 (0.2,0.6)	156 (96,259)	0.4 (0.3,0.7)	23.4 (-25.6,104.4)
1.1 (0.8,1.4)	140 (109,175)	0.3 (0.2,0.4)	-74.1 (-83.2,-61.5)
0.4 (0.2,0.6)	4 (2,7)	0.3 (0.1,0.5)	-35 (-68.1,23.1)
0.4 (0.2,0.6)	2 (1,5)	0.2 (0.1,0.4)	-51.7 (-72.5,-8.7)
1.1 (0.9,1.5)	9 (7,12)	0.3 (0.3,0.4)	-70.6 (-82.5,-57.3)
0.8 (0.7,1)	5 (3,6)	0.3 (0.2,0.4)	-66.5 (-77.5,-53.1)
1 (0.8,1.2)	7 (5,11)	0.2 (0.1,0.3)	-82.5 (-88.9,-70.4)
0.5 (0.3,0.8)	0 (0,1)	0.1 (0,0.2)	-82.6 (-93.4,-58.4)

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1.5 (0.7,2.8)	2 (1,4)	0.3 (0.2,0.4)	-82 (-92.1,-50.6)
0.9 (0.7,1.2)	40 (28,55)	0.2 (0.2,0.3)	-74.4 (-84.6,-62.7)
1.9 (1.2,2.7)	47 (36,58)	0.6 (0.4,0.7)	-71.5 (-79.7,-57)
1 (0.5,1.7)	7 (4,14)	0.2 (0.1,0.4)	-78.7 (-91.4,-31.1)
0.6 (0.4,0.9)	8 (5,12)	0.3 (0.2,0.5)	-53.8 (-74.3,-22.5)
0.6 (0.4,0.7)	1 (1,1)	0.1 (0.1,0.1)	-85 (-90,-72.6)
1.1 (1,1.4)	1890 (1401,2462)	1 (0.8,1.3)	-8.6 (-39.1,27.1)
1 (0.9,1.3)	268 (182,389)	0.8 (0.6,1.2)	-19.4 (-46.1,20)
1.1 (0.9,1.3)	21 (16,26)	0.8 (0.6,1)	-26 (-42.3,-5.1)
0.7 (0.3,1.1)	16 (7,35)	0.3 (0.1,0.6)	-57.8 (-84.6,10.2)
0.5 (0.4,0.7)	140 (101,205)	1 (0.7,1.4)	103.8 (41.2,184.2)
1.5 (0.9,2.2)	79 (48,121)	0.8 (0.5,1.2)	-48.2 (-73.5,-2.2)
1.2 (1,1.5)	914 (656,1200)	1 (0.7,1.3)	-12.9 (-41.8,22.1)
2.5 (1.3,4.1)	72 (45,110)	1.2 (0.7,1.8)	-52.3 (-77.6,9)
1.4 (1.1,1.7)	39 (28,51)	1.2 (0.8,1.5)	-18.1 (-43.9,16.1)
1.6 (0.4,3.1)	1621 (864,2825)	0.8 (0.4,1.4)	-50.4 (-71.5,25.5)
1.6 (0.3,3.5)	491 (244,772)	0.9 (0.5,1.4)	-45.3 (-70.4,75.9)
1.8 (0.4,3.9)	108 (38,190)	1.2 (0.5,2.2)	-30.8 (-55.3,43.6)
1.3 (0.5,2.3)	44 (26,77)	0.7 (0.5,1.3)	-42.4 (-67.2,41.8)
1.6 (0.4,3)	949 (506,1733)	0.7 (0.4,1.3)	-54.9 (-77,20.9)
1.2 (0.3,2.5)	16 (8,26)	0.9 (0.5,1.5)	-28.1 (-63.4,129.3)
1.1 (0.4,2)	14 (7,23)	0.7 (0.4,1.1)	-36.9 (-65.8,49.8)
1.3 (0.7,2.3)	2451 (1532,3638)	0.4 (0.3,0.6)	-65.7 (-84,-19.8)
1.3 (0.7,2.3)	2374 (1485,3524)	0.4 (0.3,0.6)	-66 (-84.3,-19.5)
1 (0.6,1.6)	64 (34,107)	0.5 (0.2,0.8)	-54.9 (-79.9,0.4)
0.4 (0.3,0.5)	13 (10,17)	0.2 (0.1,0.2)	-57.8 (-68.9,-37.4)
1.2 (1,1.4)	287 (211,384)	0.3 (0.3,0.4)	-72.1 (-81.1,-58.6)
1 (0.7,1.3)	11 (7,17)	0.3 (0.2,0.4)	-70.3 (-82.5,-51.8)
0.5 (0.4,0.6)	0 (0,1)	0.1 (0,0.1)	-87.8 (-93.7,-72.3)
0.6 (0.4,0.8)	1 (0,1)	0.1 (0.1,0.2)	-85.2 (-92.8,-69.7)
0.9 (0.8,1.1)	2 (2,3)	0.2 (0.1,0.3)	-78.2 (-86.2,-66.6)
2.1 (1.3,3.1)	13 (9,18)	0.9 (0.7,1.3)	-55.6 (-70.1,-27.1)
1.3 (1,1.5)	212 (146,293)	0.3 (0.2,0.5)	-73.6 (-83,-60.9)
1.1 (0.8,1.4)	47 (32,69)	0.4 (0.2,0.5)	-66.9 (-79.2,-46.5)
1.7 (0.4,3.5)	6516 (3509,10591)	1 (0.6,1.7)	-39.5 (-65.5,59.6)
1.7 (0.3,3.6)	187 (88,313)	0.9 (0.4,1.4)	-50.1 (-74.8,42.3)
1.7 (0.4,3.4)	9 (4,15)	1.1 (0.5,1.9)	-36.8 (-67.7,45.2)
1.2 (0.4,2.3)	10 (5,21)	0.7 (0.4,1.5)	-38.4 (-72.2,47.6)
1.2 (0.3,2.4)	79 (39,159)	0.9 (0.5,1.8)	-25.1 (-66.1,109.3)
1.7 (0.4,3.7)	1397 (741,2437)	0.9 (0.5,1.5)	-48.4 (-74.4,48.6)
1 (0.4,1.9)	372 (217,729)	0.7 (0.4,1.3)	-34 (-69.1,50.5)
1.5 (0.4,3.1)	374 (172,641)	0.9 (0.5,1.6)	-36.8 (-64.9,48.5)
2.1 (0.4,4.6)	258 (151,425)	1 (0.6,1.6)	-54.7 (-81.1,75.1)
2.3 (0.5,5)	620 (292,1104)	1.2 (0.6,2.1)	-46.3 (-72.5,63.2)
1.9 (0.3,3.9)	153 (77,264)	0.9 (0.5,1.5)	-52.3 (-77.3,64)
1.3 (0.3,2.9)	384 (124,768)	0.9 (0.3,1.7)	-31.6 (-58.9,32)
1.7 (0.3,4)	305 (78,608)	1.8 (0.5,3.5)	1.1 (-31.4,95.1)
1.3 (0.3,2.8)	788 (359,1259)	1.1 (0.5,1.7)	-19.5 (-54.7,127.5)
2.2 (0.5,4.7)	1241 (598,1931)	1.4 (0.7,2.2)	-36 (-64.4,83.8)
2.1 (0.5,4.3)	331 (195,561)	1.2 (0.7,2)	-43 (-78.3,140.4)

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0.5 (0.4,0.6)	79 (59,108)	0.1 (0.1,0.2)	-68.5 (-79.5,-53.3)
0.4 (0.3,0.6)	1 (1,2)	0.4 (0.2,0.5)	-12.8 (-39.9,35.7)
0.4 (0.4,0.6)	60 (44,80)	0.2 (0.1,0.2)	-65.2 (-78.4,-52)
0.5 (0.3,0.7)	16 (9,31)	0.1 (0.1,0.2)	-74.7 (-87.4,-35.7)
0.6 (0.5,0.7)	2 (2,4)	0.1 (0.1,0.2)	-82.7 (-89.1,-74.8)
0.3 (0.3,0.4)	411 (316,485)	0.2 (0.2,0.3)	-33.4 (-53.4,-20.9)
0.4 (0.3,0.5)	33 (24,43)	0.2 (0.1,0.3)	-47.3 (-64.8,-30.8)
0.9 (0.5,1.6)	0 (0,0)	0.3 (0.2,0.6)	-63.1 (-82.5,-8.3)
0.3 (0.3,0.4)	378 (291,447)	0.2 (0.2,0.3)	-31.8 (-52.3,-19.4)
2 (0.7,3.9)	4198 (2874,5521)	0.7 (0.5,1)	-63 (-78.9,-10.8)
2.6 (0.5,6.5)	802 (384,1431)	1.4 (0.7,2.5)	-45.6 (-68.8,70.9)
1.8 (0.8,3.4)	332 (206,477)	0.8 (0.5,1.1)	-58.8 (-79.5,0.8)
0.7 (0.4,1.1)	2 (1,3)	0.2 (0.1,0.4)	-72.3 (-87.2,-45.2)
2 (0.5,4.3)	721 (489,1043)	0.6 (0.4,0.8)	-71.3 (-87.2,18.7)
1.3 (0.4,2.5)	221 (143,358)	0.6 (0.4,0.9)	-56.6 (-81.1,32.7)
1.5 (0.9,2.3)	72 (48,105)	0.7 (0.5,1)	-52.2 (-74.3,-3.2)
1.1 (0.8,1.4)	15 (11,20)	0.6 (0.5,0.8)	-43 (-61.4,-11)
1.3 (0.4,2.6)	15 (9,23)	0.4 (0.3,0.6)	-68.4 (-86.6,-12.3)
1.6 (0.8,2.6)	43 (22,75)	1.1 (0.6,1.9)	-28.8 (-55.1,14.1)
0.7 (0.3,1.4)	76 (40,161)	0.2 (0.1,0.5)	-65.2 (-86.6,-7.1)
0.5 (0.2,0.9)	9 (4,23)	0.2 (0.1,0.6)	-53.1 (-83,15.5)
0.9 (0.5,1.6)	20 (12,36)	0.3 (0.2,0.6)	-63 (-84.3,-16.9)
0.3 (0.2,0.7)	2 (1,5)	0.1 (0,0.3)	-70.8 (-88.1,-38.9)
0.9 (0.4,1.5)	29 (10,82)	0.1 (0.1,0.4)	-83.5 (-95.1,-52.8)
2.7 (0.4,8.4)	693 (401,1115)	1.3 (0.7,2)	-53.2 (-81.4,104.2)
1.4 (0.6,2.9)	44 (26,74)	0.5 (0.3,0.8)	-66.9 (-87.1,-2)
1.7 (0.6,3.2)	39 (25,59)	0.5 (0.3,0.7)	-70.9 (-87,-24.5)
3.4 (0.9,6.6)	398 (280,561)	0.8 (0.6,1.1)	-75.8 (-90.2,-18.5)
1 (0.5,1.7)	9 (4,16)	0.3 (0.1,0.4)	-73.2 (-89.4,-43.3)
2.2 (0.5,5.7)	541 (286,916)	1.2 (0.6,2)	-45.6 (-72.4,74.9)
0.3 (0.1,0.7)	58 (21,143)	0.3 (0.1,0.7)	-4.7 (-43.8,55.3)
0.1 (0,0.3)	0 (0,0)	0.1 (0,0.4)	-20.4 (-68.5,61.2)
0.1 (0.1,0.4)	0 (0,0)	0.1 (0,0.2)	-42.5 (-81.4,75.9)
0.3 (0.1,0.5)	3 (1,5)	0.4 (0.2,0.6)	30.9 (-24.9,145.2)
0.1 (0,0.4)	0 (0,1)	0.1 (0,0.4)	-19 (-65.9,49.8)
0.3 (0.1,0.7)	0 (0,1)	0.2 (0.1,0.6)	-36.4 (-66.2,28)
0.2 (0.1,0.4)	0 (0,0)	0.2 (0.1,0.5)	-12.5 (-51.2,53.6)
0.1 (0,0.3)	0 (0,0)	0 (0,0.1)	-86.1 (-96.9,-61.2)
0.3 (0.1,0.9)	49 (16,122)	0.3 (0.1,0.8)	-10 (-52.3,61.9)
0.2 (0.1,0.5)	0 (0,1)	0.1 (0.1,0.4)	-39.7 (-76.4,38.3)
0.2 (0.1,0.5)	1 (1,5)	0.2 (0.1,0.5)	-27.1 (-65.4,57.6)
0.2 (0.1,0.6)	0 (0,0)	0.6 (0.2,2.4)	226.3 (18.2,704.2)
0.1 (0.1,0.4)	0 (0,1)	0.1 (0,0.4)	-29.3 (-68.7,44.5)
0.4 (0.1,0.8)	0 (0,0)	0.2 (0.1,0.5)	-55.2 (-83.1,35.9)
0.2 (0.1,0.5)	1 (0,2)	0.1 (0.1,0.4)	-22.3 (-55.9,43)
1 (0.4,1.8)	9515 (5318,15987)	0.6 (0.4,1.1)	-34.2 (-63.5,49.3)
1.2 (0.3,2.7)	667 (266,1377)	0.5 (0.2,1.1)	-57.4 (-83.4,37.8)
1 (0.3,2.4)	3 (1,7)	0.6 (0.2,1.2)	-44.1 (-80.3,106.7)
1 (0.5,1.7)	6842 (3851,11743)	0.7 (0.4,1.1)	-31.1 (-62.6,57.1)
0.6 (0.2,1.2)	91 (41,219)	0.3 (0.1,0.7)	-52.2 (-80.8,26.9)

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0.9 (0.3,1.7)	1911 (894,3236)	0.7 (0.3,1.1)	-26.2 (-55.2,35.2)
0.9 (0.4,1.6)	3297 (2188,4524)	0.6 (0.4,0.8)	-31.3 (-59.3,61)
1.7 (0.4,3.8)	184 (89,309)	1.1 (0.5,1.8)	-35.8 (-67.4,125.9)
0.9 (0.3,1.6)	1223 (663,2212)	0.6 (0.3,1.1)	-33.4 (-66.7,73.2)
2 (0.3,5.2)	105 (45,200)	1.3 (0.6,2.4)	-37.6 (-63.7,161.4)
0.3 (0.1,0.5)	37 (18,85)	0.2 (0.1,0.4)	-39.1 (-72.1,32.9)
1.3 (0.4,3)	2 (1,3)	0.6 (0.3,1)	-57.1 (-83.4,116.9)
0.6 (0.5,0.8)	4 (3,5)	0.7 (0.5,0.8)	4.5 (-19.6,37.4)
2 (0.5,4.5)	708 (355,1161)	1.4 (0.7,2.3)	-28.9 (-60.2,124.5)
1 (0.6,1.8)	727 (523,1027)	0.7 (0.5,1)	-34.7 (-61.3,22.4)
0.7 (0.5,0.9)	1 (0,1)	0.8 (0.5,1.2)	21.9 (-17.1,75.8)
0.6 (0.3,0.9)	51 (28,84)	0.4 (0.2,0.6)	-35.7 (-68.8,38.5)
0.5 (0.2,0.8)	58 (32,108)	0.2 (0.1,0.4)	-51.3 (-76.6,-4.3)
1.3 (0.3,3.3)	16 (9,25)	0.8 (0.5,1.3)	-38 (-67.8,117.1)
1 (0.8,1.2)	237 (179,297)	0.6 (0.5,0.8)	-33.8 (-52.1,-12.5)
1.1 (0.8,1.3)	10 (7,13)	0.6 (0.4,0.8)	-44.7 (-62.7,-23.9)
1 (0.8,1.3)	187 (137,242)	0.7 (0.5,0.9)	-26.6 (-50.2,2.2)
0.9 (0.7,1)	40 (31,49)	0.4 (0.3,0.5)	-53.7 (-64.5,-39.1)
0.6 (0.4,0.8)	389 (215,620)	0.5 (0.3,0.8)	-18.2 (-47.5,15.5)
0.4 (0.2,0.7)	10 (5,18)	0.5 (0.2,0.8)	10.3 (-28.5,64)
0.5 (0.3,0.8)	12 (6,20)	0.6 (0.3,1)	20.7 (-21.2,102.2)
0.5 (0.3,0.8)	11 (5,20)	0.4 (0.2,0.8)	-9.5 (-49.4,61.9)
0.7 (0.5,0.9)	232 (139,347)	0.5 (0.3,0.8)	-29.7 (-56.9,3.4)
0.5 (0.2,0.8)	115 (47,214)	0.6 (0.2,1)	19.6 (-15.3,77.4)
1 (0.8,1.3)	1293 (1019,1638)	0.8 (0.6,1)	-21.5 (-44.2,8.6)
1 (0.9,1.3)	1263 (999,1590)	0.8 (0.6,1)	-21.5 (-43.8,7.5)
0.6 (0.4,1)	30 (15,56)	0.5 (0.2,0.9)	-19.5 (-68.1,71.9)
0.5 (0.4,0.6)	344 (283,424)	0.2 (0.2,0.2)	-63.5 (-73.6,-53.6)
0.4 (0.2,0.6)	0 (0,0)	0.1 (0,0.1)	-85.9 (-94.1,-68.9)
0.6 (0.5,0.8)	7 (6,10)	0.2 (0.1,0.3)	-69.4 (-78.8,-56.5)
0.4 (0.3,0.5)	9 (7,12)	0.2 (0.1,0.2)	-59.7 (-72.2,-44.4)
0.5 (0.2,0.9)	1 (0,1)	0.1 (0.1,0.2)	-79.7 (-92.4,-45.1)
0.9 (0.6,1.2)	7 (5,9)	0.2 (0.2,0.3)	-73.1 (-80.3,-61)
0.6 (0.4,0.7)	4 (3,5)	0.2 (0.1,0.2)	-70.2 (-78.6,-56.1)
0.5 (0.4,0.6)	61 (45,78)	0.2 (0.1,0.2)	-59.9 (-73.2,-46.1)
0.4 (0.3,0.6)	65 (53,82)	0.2 (0.1,0.2)	-57.6 (-70.5,-44.1)
0.4 (0.4,0.7)	7 (5,10)	0.2 (0.1,0.3)	-59.9 (-78.6,-44.4)
0.4 (0.3,0.6)	0 (0,0)	0.1 (0.1,0.2)	-69.2 (-80.5,-52.7)
0.6 (0.5,0.7)	5 (4,6)	0.2 (0.1,0.2)	-67.3 (-75.8,-56.4)
0.5 (0.4,0.7)	11 (9,15)	0.1 (0.1,0.2)	-72.8 (-82.8,-59.4)
0.7 (0.5,0.7)	30 (21,40)	0.2 (0.1,0.2)	-75.1 (-83.2,-63.6)
0.2 (0.2,0.3)	0 (0,0)	0.1 (0,0.1)	-72.3 (-81.7,-56.7)
0.8 (0.6,1)	1 (1,1)	0.4 (0.3,0.5)	-52 (-64.6,-36.4)
0.5 (0.4,0.7)	16 (13,20)	0.2 (0.2,0.2)	-63.1 (-73.5,-54.1)
0.6 (0.3,0.7)	3 (2,5)	0.1 (0.1,0.2)	-77.6 (-83.5,-61.5)
0.8 (0.7,1)	6 (4,9)	0.2 (0.1,0.2)	-79 (-88,-68.6)
0.5 (0.4,0.6)	23 (16,31)	0.1 (0.1,0.2)	-68.7 (-82.3,-57.5)
0.5 (0.3,0.6)	6 (4,9)	0.1 (0.1,0.2)	-77.7 (-83.3,-65.9)
0.7 (0.5,1)	9 (7,11)	0.2 (0.2,0.3)	-70.8 (-78.7,-55.2)
0.4 (0.4,0.6)	73 (60,91)	0.2 (0.2,0.3)	-43.2 (-59.2,-32.3)

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2 (0.7,3.1)	12742 (7887,17461)	1.6 (1,2.2)	-20.1 (-44.6,76.8)
2 (0.7,3.3)	355 (223,520)	1.5 (0.9,2.2)	-26.9 (-57.2,85.8)
2.4 (0.6,4.2)	837 (439,1275)	2 (1.1,3)	-18.4 (-50.6,87.5)
2 (0.7,3.2)	729 (435,1084)	1.6 (0.9,2.3)	-21.6 (-50.6,65.4)
1.4 (0.4,2.3)	490 (235,772)	1.3 (0.6,2)	-7.2 (-39.8,77.7)
1.5 (0.6,2.3)	448 (270,772)	1 (0.6,1.8)	-31.8 (-65.2,75.1)
2.6 (0.6,4.6)	353 (212,531)	1.6 (0.9,2.4)	-40.1 (-67.2,92)
2.1 (0.6,3.4)	33 (20,56)	1.1 (0.6,1.8)	-48.4 (-74.6,45.1)
3.5 (0.7,6.5)	97 (57,148)	1.3 (0.8,2)	-62 (-81.2,50.8)
3.2 (1.2,5.6)	850 (465,1265)	1.8 (1,2.8)	-42.7 (-70.7,47.2)
1.3 (0.5,2.2)	49 (25,84)	0.8 (0.4,1.4)	-40.5 (-70.6,53.8)
2 (0.4,3.8)	514 (274,781)	1 (0.5,1.5)	-50.4 (-74.9,58.9)
1.9 (0.5,3.1)	6804 (3567,9968)	1.8 (1,2.6)	-3.6 (-32.2,104.2)
1.7 (0.7,2.6)	1 (0,3)	0.6 (0.2,1.2)	-65.3 (-89.3,31.2)
1.7 (0.6,2.6)	206 (109,372)	0.9 (0.5,1.7)	-43.1 (-75.8,70)
3.2 (0.7,5.9)	244 (143,355)	1.8 (1,2.6)	-43.8 (-69.9,89.1)
1.5 (0.7,2.3)	109 (69,178)	1 (0.6,1.6)	-35.3 (-63.7,41.7)
0.3 (0.1,0.5)	0 (0,0)	0.1 (0.1,0.4)	-47.7 (-77.4,46.3)
0.4 (0.2,0.6)	176 (94,291)	0.2 (0.1,0.4)	-40.9 (-73.7,79.5)
0.8 (0.6,0.9)	5 (3,7)	0.1 (0.1,0.1)	-87.2 (-91.9,-78.8)
1.9 (0.9,3.3)	111 (61,171)	0.2 (0.1,0.3)	-88.3 (-95.6,-67.7)
0.6 (0.3,0.8)	8 (4,13)	0.6 (0.3,1)	4.3 (-37.7,85.3)
1.8 (0.7,2.8)	592 (385,858)	1.4 (0.9,2)	-23.5 (-53.7,82.3)
0.4 (0.3,0.5)	1 (0,1)	0.3 (0.2,0.4)	-27.5 (-49.8,10)
3.3 (1.2,6.4)	210 (134,294)	1.8 (1.2,2.6)	-44.2 (-70.3,43.5)
0.3 (0.1,0.7)	0 (0,0)	0.2 (0.1,0.5)	-41.4 (-68.3,7.9)
1 (0.8,1.2)	341 (239,467)	1.6 (1.1,2.2)	55.8 (7.8,112.2)
1.3 (0.7,2)	2 (1,4)	0.5 (0.2,1)	-62.6 (-88,-9.2)
1.2 (0.5,1.8)	28 (17,48)	0.8 (0.5,1.4)	-31.7 (-65.7,54.2)
0.2 (0.1,0.6)	0 (0,0)	0.6 (0.3,1.7)	182.5 (66.6,352.5)
0.2 (0.1,0.5)	0 (0,0)	0.2 (0.1,0.5)	-9.7 (-47.1,62.5)
0.4 (0.3,0.6)	0 (0,0)	0.1 (0,0.2)	-79.8 (-92.1,-54.5)
0.5 (0.3,0.8)	0 (0,0)	0.2 (0.1,0.4)	-55.5 (-75.6,-11.3)

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Table S2: DALYs due to digestive congenital anomalies in 1990 a the age-standardised rates (ASRs) per 100, (Generated from data available from http://ghdx.healt		
	1990	
	No(95%UI)	ASRs per 100 000 (95%UI)
Global	6765566 (3775260,10452446)	108.3 (60.9,166.7)
Andean Latin America	96188	175.6 (92.2,282)
Ecuador	11325 (9220,14761)	81.3 (66.4,105.6)
Peru	53568 (26044,89453)	177.6 (87.4,295.6)
Australasia	7015 (6204,8599)	47.1 (41.6,57.6)
Australia	5707 (4856,7225)	47.2 (40.2,59.7)
New Zealand	1308 (1017,1512)	46.6 (36.5,53.7)
Caribbean	71001	168.6 (97.5,275.7)
Antigua and Barbuda	17 (13,28)	30.5 (23.3,48.9)
Barbados	148 (118,182)	75.1 (60.3,92.1)
Belize	319 (231,400)	107.3 (78,134.6)
Bermuda	18 (11,26)	43 (26.2,61.6)
Cuba	12941 (9023,15729)	152.9 (106.7,185.7)
Dominica	42 (27,63)	48.8 (30.9,72)
Dominican Republic	18405 (9681,28431)	174.7 (92.3,270.5)
Grenada	43 (29,67)	37.8 (25.8,59.5)
Guyana	1365 (952,1705)	112.1 (79,139.2)
Haiti	28162 (9552,66082)	245.8 (82.6,575.8)
Jamaica	2713 (1983,3561)	99.1 (72.6,129.7)
Puerto Rico	1834 (1491,2222)	59.4 (48.3,71.9)
Saint Kitts and Nevis	31 (23,39)	70.4 (52.2,88.3)
Saint Lucia	107 (74,154)	63.4 (44.3,91.4)
Saint Vincent and the Grenadines	128 (90,164)	104.4 (73.9,134.1)
Suriname	933 (500,1323)	214.8 (116,304.1)
Trinidad and Tobago	1234 (947,1534)	107 (82.2,132.8)
United States Virgin Islands	55 (32,91)	50.6 (29.9,82.9)
Central Asia	67143 (52615,84743)	72.6 (57.2,91.5)
Armenia	6875 (3952,9541)	189.9 (109.8,263.1)
Azerbaijan	6501 (3454,11073)	74.7 (40.1,126.6)
Georgia	2054 (1286,2907)	49.9 (31.5,70.1)
Kazakhstan	15424 (10735,19663)	87.8 (61.7,111.6)
Kyrgyzstan	7640 (4835,9896)	122.1 (77.8,157.6)
Mongolia	7574 (3655,14267)	222.3 (107.8,417.5)
Tajikistan	4981 (2768,7877)	51.4 (28.9,81.1)
Turkmenistan	5758 (3831,7779)	97.8 (65.6,131.9)
Uzbekistan	10336 (7173,18521)	31.4 (22.1,56.1)
Central Europe	81876	98.1 (73.7,126.4)
Albania	1457 (829,2279)	37.8 (21.6,58.9)
Bosnia and Herzegovina	1100 (549,1775)	34 (17.1,54.8)
Bulgaria	5117 (4145,6700)	105 (85.4,137.3)
Croatia	1993 (1614,2397)	73.9 (59.8,88.8)

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Hungary	5636 (4387,6561)	93.8 (73.2,109.2)
Montenegro	228 (134,374)	47.5 (28.1,77.7)
North Macedonia	2254 (973,4139)	138.1 (59.8,253)
Poland	22943 (17915,28323)	86.5 (67.6,106.8)
Romania	26518 (16348,37098)	175.5 (108.7,244.5)
Serbia	6163 (3153,9957)	93.3 (48.1,150.5)
Slovakia	2147 (1572,2980)	56.3 (41.4,78)
Slovenia	576 (463,684)	53.3 (42.8,63.2)
Central Latin America	238043 (204970,295059)	101.8 (87.8,125.8)
Colombia	40920 (34046,50240)	94.8 (79.1,116.4)
Costa Rica	3889 (3238,4620)	100.2 (83.6,119.3)
El Salvador	5129 (2431,8063)	63.3 (30.4,99.5)
Guatemala	6971 (5265,10389)	44 (33.5,65)
Honduras	11250 (6824,16758)	134.4 (81.9,199.3)
Mexico	126995 (108990,159330)	106.7 (91.7,133.4)
Nicaragua	15075 (7857,24963)	224.8 (117.7,372.4)
Panama	3583 (2888,4392)	127.7 (103.1,156)
Central Sub-Saharan Africa	165360 (41168,320477)	142.8 (36.6,275.3)
Angola	32028 (6217,69092)	144.6 (29.4,310)
Central African Republic	9162 (1949,19892)	162.1 (36.2,351)
Congo	4878 (1666,8725)	116.8 (41.1,208.1)
Democratic Republic of the Congo	116663	143.7 (37.4,267.1)
Equatorial Guinea	1023 (268,2090)	111.5 (30.3,225.5)
Gabon	1605 (592,2952)	98 (37.6,179.2)
East Asia	1299821 (699293,2351758)	114.2 (61.8,206.2)
China	1270295 (678297,2310570)	115.8 (62.2,210.1)
Democratic People's Republic of Korea	23436 (13135,37150)	93.2 (52.8,147.1)
Taiwan (Province of China)	6089 (4874,6936)	39.7 (31.9,45.1)
Eastern Europe	159950 (127744,188245)	110.1 (88,129.4)
Belarus	6157 (4483,7864)	89.4 (65.2,114)
Estonia	500 (371,609)	47.9 (35.5,58.3)
Latvia	967 (714,1261)	54.7 (40.6,71)
Lithuania	2295 (1856,2778)	85.4 (69.2,103.2)
Republic of Moldova	7263 (4528,10615)	189.4 (118.6,276.1)
Russian Federation	111076	114.9 (92.8,133.2)
Ukraine	31693 (23733,40131)	97.9 (73.5,123.8)
Eastern Sub-Saharan Africa	611204 (144359,1254328)	152.5 (37.5,312.2)
Burundi	18278 (3561,38275)	156.3 (32.4,326.4)
Comoros	1372 (337,2771)	152.5 (39.8,305.2)
Djibouti	770 (267,1484)	108.9 (38.8,209)
Eritrea	7067 (1675,14544)	106.1 (26.4,216.7)
Ethiopia	162151 (35071,355594)	150.9 (34.4,329.6)

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Kenya	41789 (16426,78920)	92.2 (37.2,173.1)
Madagascar	31743 (8355,65489)	134.9 (36.8,278.8)
Malawi	42787 (8686,89686)	193.2 (40.6,409.6)
Mozambique	54756	203 (41.4,450.9)
Rwanda	24002 (4284,49923)	167.9 (31.9,348.6)
Somalia	20039 (4409,45311)	116.3 (27.1,261.3)
South Sudan	17969 (3301,40832)	157.8 (30.4,359.5)
Uganda	49881	121 (25.9,252.6)
United Republic of Tanzania	106802 (23036,226953)	197.9 (44.4,418.8)
Zambia	31362 (6787,65799)	185.1 (41.9,389.8)
High-income Asia Pacific	40566 (31975,51216)	42.9 (33.9,53.9)
Brunei Darussalam	126 (88,180)	38.9 (27.6,55.4)
Japan	25003 (20684,31231)	41.5 (34.4,51.7)
Republic of Korea	14206 (8437,21442)	44.6 (26.8,67)
Singapore	1231 (963,1565)	53.6 (42.4,67.6)
High-income North America	66294 (60620,84008)	31.8 (29,40.1)
Canada	6489 (5628,8217)	34.3 (29.8,43.2)
Greenland	46 (23,78)	82.3 (40.9,138.6)
United States of America	59757 (54619,75578)	31.5 (28.8,39.7)
North Africa and Middle East	927411 (330053,1814572)	180.2 (64.8,352.2)
Afghanistan	46749 (8803,115122)	236.1 (44.6,577.4)
Algeria	61182	167.6 (71.4,305.9)
Bahrain	394 (210,625)	63.3 (34.2,99.6)
Egypt	162188	184 (47.1,384.8)
Iraq	37875 (12076,72972)	117.4 (38.3,225.2)
Jordan	8327 (4830,12776)	133.6 (78.1,204.1)
Kuwait	1633 (1173,2075)	98.4 (70.6,125)
Lebanon	4657 (1625,9502)	116.1 (41.2,236.1)
Libya	8851 (4612,14734)	142.7 (75.3,236.5)
Morocco	24195 (9377,46737)	65.8 (25.8,126.3)
Oman	1553 (706,2913)	46.3 (21.6,86)
Palestine	3512 (1777,5851)	85.8 (43.9,142.6)
Qatar	166 (84,346)	31.8 (16.8,65)
Saudi Arabia	19388 (9450,32263)	80.9 (40.1,134)
Sudan	96103	243.8 (38.9,747.1)
Syrian Arab Republic	27844 (10785,56489)	128.7 (50.5,259.7)
Tunisia	15954 (6177,30387)	152.8 (59.8,290.4)
Turkey	214304	306.8 (88,591.4)
United Arab Emirates	1974 (1065,3451)	86.7 (47.6,150.8)
Yemen	58583	194.7 (42.7,515.1)
Oceania	2978 (1127,6557)	29.2 (11.7,63.1)
American Samoa	8 (4,26)	11 (5.3,31.9)
Cook Islands	2 (1,7)	11.5 (6.3,33.7)
Fiji	224 (126,408)	25.9 (14.9,45.6)
Guam	19 (7,58)	11.4 (4.9,33.4)
Kiribati	39 (12,83)	32.4 (10.3,66.9)
Marshall Islands	11 (5,29)	16.7 (7.8,41.9)
Northern Mariana Islands	5 (3,17)	11.2 (5.6,30.6)

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Papua New Guinea	2188 (664,5387)	32.7 (10.6,79.4)
Samoa	47 (22,115)	19.4 (9.5,45.6)
Solomon Islands	128 (52,310)	21 (9.1,48.9)
Tokelau	0 (0,1)	18.5 (9.1,57.3)
Tonga	20 (10,61)	13.7 (7.5,39.9)
Tuvalu	5 (2,11)	33.4 (11.2,70.7)
Vanuatu	48 (19,123)	17.7 (7.6,43.4)
South Asia	1420099 (624058,2597525)	89 (39.8,161.7)
Bangladesh	211189	107.8 (32.4,244.6)
Bhutan	957 (248,2265)	93.3 (25,219)
India	1028625 (482918,1825289)	88.1 (41.9,155.4)
Nepal	20915 (7113,40510)	58.3 (20.5,111.8)
Pakistan	158412 (60538,308938)	81.2 (31.8,156.9)
Southeast Asia	474034 (224259,850165)	81.7 (39,146.2)
Cambodia	29904 (7627,65745)	153.6 (39.3,337.1)
Indonesia	176103 (71279,315073)	79.7 (32.5,142.2)
Lao People's Democratic Republic	14251 (2171,35990)	183.9 (28.3,466.6)
Malaysia	6051 (3317,11503)	26.3 (14.8,49.4)
Maldives	490 (133,1099)	118.7 (32.9,264.2)
Mauritius	622 (482,794)	57.8 (44.9,73.7)
Myanmar	90634	175.9 (43.9,401.9)
Philippines	88789	94.7 (55.2,158.7)
Seychelles	48 (33,66)	62.3 (42.6,85.5)
Sri Lanka	8656 (5165,14058)	51.3 (31.1,82.8)
Thailand	21541 (11639,35591)	43.4 (23.7,71.4)
Timor-Leste	1888 (482,4635)	121 (30.7,295.8)
Southern Latin America	44158 (36053,56205)	88 (72.2,111.8)
Uruguay	2611 (1988,3230)	97.8 (74.8,120.8)
Argentina	29836 (23164,39342)	90.2 (70.4,118.9)
Chile	11708 (9893,13685)	81.2 (68.8,94.6)
Southern Sub-Saharan Africa	42939 (29917,54502)	58 (40.7,73.7)
Botswana	805 (379,1360)	38.7 (19,64.2)
Lesotho	1195 (682,1819)	48.8 (28.3,73.8)
Namibia	993 (539,1603)	43.2 (23.8,68.7)
South Africa	31679 (22573,41315)	65.9 (47.2,85.6)
Zimbabwe	7513 (3580,12973)	42.6 (20.9,72.4)
Tropical Latin America	151289 (124875,189759)	95.1 (78.6,119)
Brazil	147778 (122051,185059)	96.6 (80.1,120.7)
Paraguay	3511 (2140,5658)	58 (35.6,92.7)
Western Europe	101225	46.6 (39.3,59.8)
Andorra	10 (5,16)	38.4 (21.2,60.6)
Austria	2466 (2096,3103)	57.1 (48.7,71.3)
Belgium	2271 (1908,2961)	39 (33,50.5)

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Cyprus	324 (146,546)	50.5 (23.3,84.2)
Denmark	2417 (1598,3094)	81.5 (54.3,104)
Finland	1598 (1241,1946)	52.8 (41.2,64.3)
France	16086 (13574,20134)	44.7 (37.9,55.7)
Germany	16386 (13140,24260)	39.6 (32,58.2)
Greece	2099 (1713,3148)	42 (34.4,62.8)
Iceland	88 (63,113)	41.8 (30,52.8)
Ireland	1339 (1098,1579)	51.8 (42.7,61)
Israel	2254 (1727,3062)	45.6 (35,61.3)
Italy	16107 (12513,18014)	60.7 (47.5,68.1)
Luxembourg	48 (40,70)	21.4 (17.7,30.2)
Malta	193 (151,241)	73.5 (57.7,91.1)
Netherlands	4522 (3814,5662)	49.4 (41.9,61.4)
Norway	1479 (718,1766)	53.3 (26.6,63.4)
Portugal	3997 (3294,5142)	72.5 (59.8,92.9)
Spain	8256 (7113,11040)	43.2 (37.2,57.6)
Sweden	2632 (1762,3076)	46 (31.2,53.5)
Switzerland	2643 (1673,3524)	67.3 (43,89.6)
United Kingdom	13916 (12177,19791)	38.4 (33.6,53.8)
Western Sub-Saharan Africa	696973 (223980,1095863)	176.4 (57.6,279)
Benin	19315 (6292,31281)	182.5 (60.1,296.7)
Burkina Faso	44093 (11711,76212)	213.4 (56.9,371.4)
Cameroon	37476 (12578,60817)	175.5 (60.2,282.9)
Chad	17390 (5217,29180)	124.3 (38,208.9)
Ghana	36695 (14271,56100)	134 (53.5,203.5)
Guinea	30078 (7407,52130)	233.2 (57.8,410.8)
Guinea-Bissau	3668 (1102,6011)	181.1 (55.3,294.9)
Liberia	15491 (2917,29207)	308.3 (59.3,580.5)
Mali	53133 (21674,93075)	278.2 (110.7,495.9)
Mauritania	4645 (1705,7440)	118.9 (45,192.3)
Niger	33492 (7364,61835)	175.6 (38,334.8)
Nigeria	300187 (85930,484589)	167.4 (48,273)
Sao Tome and Principe	326 (133,494)	154.3 (64,233.8)
Senegal	22931 (7875,35490)	147.9 (51.9,230.1)
Sierra Leone	25223 (5616,47324)	283.9 (63.9,531.6)
Togo	9865 (4140,14426)	136.3 (58.3,199.3)
Federated States of Micronesia	34 (14,75)	24 (10,50.2)
Socialist Republic of Viet Nam	34370 (14366,54093)	37.7 (16.1,58.9)
Czech Republic	4435 (3365,5367)	71.6 (54.5,86.7)
Islamic Republic of Iran	131468	174.2 (81.4,298.1)
Kingdom of Eswatini	755 (461,1073)	52 (32.2,73.5)
Republic of Coate d'Ivoire	40099 (13835,61791)	160.6 (57.4,246.4)
Commonwealth of the Bahamas	102 (74,131)	39.7 (28.9,51)
Plurinational State of Bolivia	31296 (11643,60674)	295.7 (110.4,571)
Republic of Palau	4 (2,9)	28.5 (12.8,61.8)
Bolivarian Republic of Venezuela	24232 (19806,29137)	94 (77.2,112.8)
Republic of Cabo Verde	697 (371,1046)	118.5 (64.6,178)
Republic of the Gambia	2145 (938,3253)	107.4 (47.9,163.5)

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Republic of Niue	0 (0,1)	20.3 (10,52.8)
Republic of Nauru	3 (2,8)	21.1 (10.3,49.8)
Republic of San Marino	5 (3,8)	42.6 (24.4,69.4)
Principality of Monaco	4 (3,7)	39 (24.9,58.1)

95% UI=95% uncertainty intervals.

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nd 2021 and the percentage change in 000, by location hdata.org/gbd-results-tool)		
2021		Percentage change in the ASRs per 100 000
No(95%UI)	ASRs per 100 000 (95%UI)	
4324562 (3246584,5390461)	70.4 (53.1,87.6)	-35 (-57.1,15.5)
53932	92.3 (65.5,122.4)	-47.4 (-71.2,7.3)
14808	97.2 (70.8,129.8)	19.6 (-21,73.2)
19952	63.3 (38.6,94.8)	-64.3 (-83.9,-13.1)
2354 (1830,3511)	14.2 (11.2,21.1)	-69.8 (-76.8,-57.8)
1858 (1396,2925)	13.6 (10.3,21.3)	-71.2 (-78.9,-58.8)
496 (389,664)	17.3 (13.7,23.1)	-62.9 (-71.8,-49.7)
43694	116.1 (70.1,184.3)	-31.1 (-53.5,11.4)
13 (10,19)	26.2 (21.3,39.6)	-14.3 (-35.2,13.5)
82 (57,115)	65.6 (45.9,91.4)	-12.7 (-41,23.8)
259 (202,333)	71.2 (55.7,91.4)	-33.6 (-51.4,-7.2)
6 (4,9)	24.5 (15.6,38.4)	-43 (-65.4,-10.7)
2394 (1946,3009)	50 (41,62.9)	-67.3 (-76,-52.5)
30 (19,45)	96.6 (59.1,143.1)	98.1 (24.7,206.9)
8815 (4747,16927)	87.2 (47.3,166.2)	-50.1 (-76.4,-2.8)
19 (14,27)	30.7 (22.1,42.2)	-18.8 (-40.7,16.9)
548 (362,779)	77.8 (51.9,110.2)	-30.6 (-55.3,2.5)
27114	169.4 (73,316.7)	-31.1 (-58.4,40.9)
1139 (826,1567)	72.1 (52.4,99.3)	-27.2 (-52.3,8.2)
389 (272,510)	43.7 (30.8,57.3)	-26.5 (-47,-3.6)
15 (11,20)	53.7 (40.6,71.4)	-23.7 (-44.6,7.7)
38 (27,59)	47.8 (33.2,73.1)	-24.7 (-52.4,18.4)
39 (29,53)	61.7 (45.6,83.8)	-40.9 (-59.8,-9.7)
647 (413,954)	152.6 (97.8,225)	-29 (-57.7,17.5)
605 (435,818)	84.8 (61.1,114.5)	-20.8 (-47,16)
6 (3,15)	19 (9.3,43.7)	-62.4 (-82.5,-27.1)
55814	57.8 (46.1,73.4)	-20.4 (-38.8,6.4)
1743 (1223,2297)	104.7 (73.5,137.4)	-44.8 (-62.7,-9.8)
3121 (1773,5146)	48.7 (27.8,80)	-34.9 (-66.2,24.5)
969 (681,1300)	45.4 (32.3,60.8)	-8.9 (-45.2,64.6)
11646 (8513,16279)	60.8 (45,84.2)	-30.8 (-53.8,-1.9)
6789 (5484,8417)	91.2 (73.8,112.6)	-25.3 (-49,14.6)
3166 (1996,4450)	87 (55.3,121.9)	-60.9 (-80.9,-13.3)
6679 (3390,12076)	50 (25.7,89.6)	-2.7 (-49.7,115.7)
7221 (4288,10626)	137.9 (82.2,202.1)	40.9 (-4.2,103.9)
14480 (9108,23620)	38.8 (24.8,62.5)	23.5 (-23.4,99.3)
13277	26.5 (20.9,32.9)	-73 (-82.1,-60.4)
339 (178,629)	25.5 (13.5,47)	-32.4 (-65.1,23.4)
227 (134,458)	17.1 (10.3,34.3)	-49.6 (-70.6,-8)
885 (665,1144)	32.1 (24.3,41.2)	-69.4 (-81.2,-56.7)
436 (321,567)	26 (19.4,33.7)	-64.8 (-75.7,-51.5)

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725 (514,1043)	17.5 (12.5,24.9)	-81.4 (-87.6,-69.6)
30 (15,61)	9.3 (4.7,18.4)	-80.5 (-91.3,-56.3)
237 (140,368)	26.1 (15.7,40.5)	-81.1 (-91.5,-49)
3811 (2727,5129)	23.1 (16.6,31)	-73.3 (-83.5,-61.7)
4417 (3444,5374)	51.4 (40.3,62.4)	-70.7 (-79,-56.1)
679 (394,1346)	21.2 (12.5,41.7)	-77.3 (-90.3,-30.1)
717 (465,1152)	27.1 (17.6,43.1)	-52 (-72.3,-21.6)
79 (57,126)	9.2 (6.7,14.4)	-82.7 (-87.9,-70.7)
172866 (128905,224318)	93.1 (69.6,120.4)	-8.6 (-38.7,26.5)
24694	77 (53.1,109.9)	-18.8 (-45.2,19.8)
1916 (1508,2418)	73.4 (58.3,91.9)	-26.8 (-42.7,-5.7)
1489 (672,3234)	27.3 (12.6,58.1)	-57 (-83.7,9.3)
12727 (9250,18582)	89.4 (65.1,130.1)	103.4 (40.9,183.3)
7211 (4407,11000)	69.3 (42.5,105.3)	-48.4 (-73.3,-2.8)
83721 (61043,109287)	92.9 (68.4,120.7)	-12.9 (-41.3,22)
6560 (4088,9966)	107.6 (67.6,162.7)	-52.1 (-77.4,8.8)
3537 (2612,4606)	104.6 (77.2,135.8)	-18.1 (-43.5,15.5)
148021 (79981,256282)	71.3 (39.2,122.6)	-50.1 (-71,21.9)
44750	79.8 (41.4,124)	-44.8 (-70,71.7)
9790 (3523,17142)	112.4 (41.9,195.4)	-30.7 (-54.9,39.9)
4052 (2435,6972)	67.7 (41.7,116.4)	-42.1 (-66.5,37.6)
86743	65.2 (36.5,117.4)	-54.6 (-76.5,17.2)
1429 (758,2315)	80.8 (44,131.1)	-27.5 (-62.3,124.3)
1257 (680,2079)	62.1 (34.1,102.7)	-36.6 (-64.8,45.5)
232392 (148764,340916)	40.1 (25.6,59)	-64.9 (-83.4,-19.7)
225105 (144205,330493)	40.4 (25.8,59.4)	-65.1 (-83.7,-19.3)
5931 (3238,9791)	42.4 (23.4,69.4)	-54.5 (-78.9,-2.2)
1356 (1082,1747)	18.3 (14.7,23.4)	-53.9 (-64.6,-35.3)
27425 (20624,36023)	31.9 (24.3,41.4)	-71 (-80.1,-57.7)
1080 (666,1616)	27.4 (17.2,40.7)	-69.4 (-81.2,-51.4)
40 (25,75)	6.9 (4.5,12.8)	-85.6 (-91.4,-71.2)
70 (43,129)	9.2 (5.7,16.5)	-83.2 (-91.2,-68.2)
222 (156,320)	20 (14.3,28.4)	-76.6 (-85,-65.2)
1156 (838,1615)	85 (61.7,118.5)	-55.1 (-69.6,-26.6)
20347	31.4 (22.4,42.1)	-72.6 (-82,-60.1)
4510 (3169,6431)	33.6 (23.7,47.8)	-65.7 (-78,-45.3)
592000 (325216,955784)	92.7 (52.8,148.7)	-39.2 (-65,56)
17037 (8165,28336)	78.6 (39.4,129.9)	-49.7 (-74.2,39.4)
773 (386,1398)	96.6 (49.5,174.2)	-36.6 (-67.3,43.8)
960 (488,1882)	67.6 (34.6,132.3)	-37.9 (-70.9,45.4)
7210 (3670,14352)	79.5 (42,157.2)	-25.1 (-65.5,103.1)
126936 (68196,220082)	78.4 (44.3,134.6)	-48.1 (-74,44.5)

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34077	61 (36.2,117.6)	-33.9 (-68.3,45.5)
33962	85.4 (41.7,145)	-36.7 (-64.5,45.3)
23469	87.8 (53.3,143.9)	-54.5 (-80.7,68.8)
56239	109.4 (53.8,192.1)	-46.1 (-72.2,59.9)
13997 (7173,23926)	81.1 (42.5,137.5)	-51.7 (-76.8,63.6)
34942	79.6 (28.1,156.7)	-31.5 (-58.4,30.7)
27494 (7297,54568)	159.2 (43.7,316.6)	0.9 (-31.3,91)
71679	97.4 (47.6,153.6)	-19.5 (-54.2,117.5)
112620 (54910,174649)	127.3 (63.3,197)	-35.7 (-64.1,80.8)
30091	105.9 (63.1,177.7)	-42.8 (-78,134.7)
8157 (6281,10848)	14.7 (11.5,19.3)	-65.6 (-77,-50.9)
101 (65,143)	35 (22.8,49.1)	-10 (-37.3,37.8)
6141 (4693,7908)	15.5 (11.9,19.7)	-62.7 (-75.7,-50.6)
1655 (1057,3062)	12.8 (8.3,23.4)	-71.2 (-84.9,-31.6)
260 (191,392)	10.8 (8.1,15.6)	-79.8 (-86.4,-71.3)
40097	21.7 (17.3,25.4)	-31.8 (-51.2,-20.2)
3193 (2415,4056)	18.7 (14.3,23.5)	-45.4 (-62.5,-28.7)
11 (7,19)	31.1 (19,52.3)	-62.2 (-81.9,-6.8)
36892	22 (17.4,25.8)	-30.3 (-49.7,-18.5)
385822 (268906,506203)	67.8 (47.6,88.8)	-62.4 (-78.4,-10.9)
72684	128.8 (62.7,227.9)	-45.4 (-68.6,66.6)
30503	70.3 (45,100.1)	-58.1 (-78.9,1.1)
155 (94,301)	18.7 (11.5,36.1)	-70.4 (-85.6,-43.6)
66195	54 (37.3,77.9)	-70.6 (-86.8,17.4)
20450	51.8 (34.3,82.5)	-55.9 (-80.5,30.6)
6726 (4551,9690)	65.5 (44.5,93.9)	-51 (-72.9,-2.2)
1384 (1037,1836)	57.9 (43.6,76.4)	-41.2 (-59.8,-9.4)
1424 (911,2194)	38.1 (24.6,58.1)	-67.2 (-85.8,-12.2)
3931 (2025,6772)	101.5 (52.5,173.9)	-28.9 (-54.8,13.2)
7192 (4048,14775)	24 (13.6,48.7)	-63.5 (-85.4,-7.5)
856 (461,2162)	23 (12.5,57.1)	-50.3 (-80.1,15)
1857 (1122,3281)	32.6 (20,57.2)	-62 (-83.3,-17.4)
179 (94,484)	10.8 (6,27.2)	-66.2 (-83.8,-34.1)
2983 (1254,7608)	14.6 (6.8,35.5)	-81.9 (-93.9,-52)
62989	115.2 (67.9,182.7)	-52.7 (-81.1,97.6)
4063 (2427,6767)	43.3 (25.9,71.6)	-66.3 (-86.4,-2.8)
3638 (2375,5389)	45.6 (30,67.8)	-70.2 (-86.4,-25.1)
37205	76.4 (54.4,105.8)	-75.1 (-89.6,-17.8)
867 (438,1491)	24.1 (12.2,41.2)	-72.2 (-88.5,-42.2)
49131	106.5 (57.2,178.7)	-45.3 (-72.1,71.7)
5439 (2138,13123)	28 (11.8,65.8)	-4.1 (-41.8,52)
3 (1,11)	9 (4.3,35.5)	-18 (-61.7,48.5)
1 (0,2)	7.3 (3,23.7)	-36.6 (-70.9,54.9)
283 (145,484)	33.7 (17.8,56.5)	30.3 (-22.5,134.3)
11 (5,47)	10 (4.9,38)	-11.9 (-54.5,49.3)
28 (12,71)	21.1 (9.7,51.4)	-34.7 (-64.6,24)
7 (3,23)	14.8 (6.9,42.5)	-11.4 (-48.2,48.3)
1 (0,2)	3.3 (1.7,8.5)	-70.8 (-85.7,-43)

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4607 (1645,11179)	29.7 (11.4,70.2)	-9.2 (-50.2,56.7)
32 (14,109)	12.1 (6,37.5)	-37.7 (-72.3,31.6)
139 (60,449)	15.7 (7.4,47.2)	-25.2 (-62.3,50.7)
0 (0,2)	57.1 (19.8,216)	209.4 (15.8,618.4)
13 (5,49)	10.2 (4.9,35.2)	-25.1 (-61.8,36.1)
2 (1,5)	15.6 (7.6,43.9)	-53.3 (-80.7,23.7)
54 (24,152)	14 (6.6,37.4)	-20.5 (-53,38.3)
875768 (498385,1459053)	58.8 (33.9,97.4)	-33.9 (-63.1,47.2)
61805	46.6 (19.8,94.6)	-56.7 (-82.6,35.8)
312 (130,631)	53 (22.3,106.1)	-43.2 (-79.8,104.9)
630021 (360769,1071077)	61 (35.2,102.9)	-30.8 (-62.2,55.4)
8538 (4085,20199)	28.6 (14,66.8)	-50.9 (-79.8,24.1)
175093 (84352,294210)	60.1 (29.6,100.7)	-26 (-54.7,33.7)
303106 (203607,413264)	56.7 (38.3,77.3)	-30.6 (-58.6,58.9)
16725 (8223,27969)	99.1 (49.1,165)	-35.5 (-67,120.2)
112266 (62075,200540)	53.5 (29.7,95.3)	-32.9 (-65.8,70.6)
9555 (4143,18058)	115.5 (51.1,217.5)	-37.2 (-63.3,151.7)
3669 (1917,8047)	16.7 (9.1,35.7)	-36.5 (-69,30.1)
152 (91,278)	52.3 (31.6,95.5)	-56 (-82.7,110.2)
364 (291,444)	60.7 (48.6,73.7)	4.9 (-18.6,36.1)
64265	126.1 (64.2,204.7)	-28.3 (-59.7,122)
66922	62.3 (45.7,87.5)	-34.2 (-60.5,20.8)
58 (36,84)	77.1 (48.8,112.8)	23.7 (-15.3,77.9)
4779 (2775,7828)	33.6 (19.8,54.6)	-34.5 (-67.6,38.1)
5501 (3244,9911)	21.5 (12.8,38.5)	-50.4 (-75.2,-5.3)
1434 (863,2253)	75.5 (45.9,117.8)	-37.7 (-67.3,107.1)
22116	59.4 (45.8,74.2)	-32.5 (-50.8,-11.4)
939 (712,1218)	55.2 (42,71.4)	-43.6 (-61.5,-23.1)
17352	67.2 (49.6,86.3)	-25.6 (-49.3,2.8)
3823 (3074,4696)	39.6 (32,48.3)	-51.2 (-62.2,-36.7)
35851	47.5 (27.3,74.3)	-18.1 (-46.7,14.5)
964 (480,1636)	43.1 (21.9,72.6)	11.4 (-26.7,63.9)
1112 (582,1771)	57.7 (30.6,90.8)	18.3 (-22.6,92.8)
1026 (456,1834)	39.1 (17.8,69)	-9.6 (-48.3,59.5)
21470	46.7 (28.7,68.4)	-29.2 (-55.5,3.4)
10568 (4461,19394)	49.9 (21.4,90.2)	17.1 (-17.1,73.3)
120661 (95772,151604)	74.5 (59.7,92.9)	-21.6 (-43.6,6.7)
117782 (93790,147865)	75.6 (60.6,94.1)	-21.7 (-43.4,5.5)
2879 (1475,5209)	47.5 (25,84.9)	-18.1 (-65.4,69.3)
34488	18.4 (15.4,22.6)	-60.7 (-71.2,-51.2)
2 (1,2)	7.1 (4.6,10.2)	-81.5 (-90.5,-63.2)
731 (574,968)	19.2 (15.2,25.1)	-66.4 (-76.1,-54.2)
889 (685,1205)	16.9 (13.2,22.5)	-56.7 (-69.2,-42)

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78 (47,138)	11.7 (7.4,20)	-76.7 (-90.1,-42.8)
680 (528,858)	23.5 (18.3,29.2)	-71.2 (-78.7,-58.9)
373 (289,509)	17.1 (13.5,22.9)	-67.6 (-75.9,-53.8)
6037 (4643,7622)	19.1 (14.8,23.9)	-57.4 (-71.2,-43.6)
6444 (5331,8120)	18 (15.1,22.3)	-54.5 (-67.5,-41.3)
694 (526,962)	18.3 (14,24.8)	-56.6 (-75.7,-41)
30 (22,42)	15.1 (11.6,20.4)	-63.9 (-75.4,-47.9)
478 (382,614)	18.2 (14.7,23.1)	-64.8 (-73.3,-54.1)
1143 (897,1503)	13.8 (10.9,18.1)	-69.7 (-79.6,-57)
3182 (2351,4106)	16.8 (12.6,21.7)	-72.3 (-80.7,-60.5)
21 (15,39)	7.2 (5.4,13.1)	-66.3 (-75.2,-53.2)
75 (57,97)	37.1 (28.5,47.2)	-49.6 (-62.1,-33.7)
1584 (1317,1925)	19.8 (16.6,23.8)	-60 (-70.9,-51.2)
333 (208,460)	13 (8.3,17.9)	-75.5 (-80.8,-59.7)
621 (440,836)	16.5 (12,21.9)	-77.3 (-86.5,-67)
2328 (1655,3045)	14.7 (10.6,19.2)	-65.9 (-79.6,-55)
617 (460,876)	12.1 (9.1,16.8)	-73.8 (-79.3,-62.1)
859 (691,1065)	21.4 (17.3,26.2)	-68.2 (-76.1,-52.8)
7256 (6049,9172)	22.8 (19.3,28.6)	-40.5 (-56.2,-30.1)
1151281 (718892,1575459)	141 (89,192.8)	-20.1 (-44.3,76.9)
32127	133.8 (85.5,194.6)	-26.7 (-56.7,85.8)
75640	174.5 (94.5,265.1)	-18.2 (-50.3,89)
65980	137.6 (83.3,203.2)	-21.5 (-50.4,65.8)
44229	114.8 (56,178.7)	-7.7 (-39.6,75.8)
40848	91.3 (56,156.1)	-31.8 (-65,74.8)
31947	139.5 (84.8,208.2)	-40.2 (-67,89.4)
3032 (1874,5078)	92.8 (57.7,154.7)	-48.7 (-74.8,43.8)
8785 (5274,13388)	116.4 (70.9,176.9)	-62.2 (-81.1,50.6)
76733	159.8 (87,240.3)	-42.6 (-70.3,50.4)
4484 (2330,7625)	71.3 (37.2,122.3)	-40 (-69.6,54.5)
46661	87.5 (47.3,133.3)	-50.2 (-74.6,58.7)
613670 (325150,894372)	161.4 (86.8,234.6)	-3.6 (-32.1,104)
121 (46,235)	53.2 (20.5,102.6)	-65.5 (-88.7,29.5)
18751 (9978,33690)	84.2 (44.6,151.1)	-43.1 (-75.1,68.4)
22050	159.5 (94.6,230)	-43.8 (-69.7,87.8)
9857 (6323,16092)	87.7 (55.8,142.7)	-35.7 (-63.5,40.1)
11 (5,35)	13.1 (6.6,39.6)	-45.4 (-75.5,37.1)
16995 (9792,27440)	23.2 (13.5,36.9)	-38.6 (-71.4,70.5)
502 (335,714)	10.2 (6.9,14.2)	-85.8 (-90.5,-77.5)
11053 (6330,16361)	22.1 (12.8,32.5)	-87.3 (-95,-66.5)
711 (382,1225)	53.7 (29.4,91.1)	3.3 (-37.9,81.4)
53630	122.7 (80.6,177.7)	-23.6 (-53.1,81)
56 (39,79)	29.4 (20.6,41.4)	-26 (-47.5,9.6)
19172	166.3	-43.8 (-69.7,42.2)
1 (1,4)	17.3 (9.7,44.3)	-39.3 (-65.5,3.6)
31011	145.4	54.7 (7.8,109.8)
174 (62,350)	44.1 (15.9,88.2)	-62.7 (-87.3,-9.9)
2549 (1509,4350)	72.6 (42.9,124.7)	-32.4 (-65.4,54.5)

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1 (0,2)	54.9 (28.4,156.2)	169.9 (64.6,310.4)
2 (1,7)	19.4 (9.1,48.8)	-8.1 (-44,54)
3 (1,5)	19.6 (10.2,33.1)	-54.1 (-74.4,-12.2)
1 (1,2)	9.7 (5.4,15.6)	-75.1 (-87.8,-50.4)

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BMJ Open

Burden of digestive congenital anomalies among children aged 0-14 years in 204 countries and territories, 1990-2021: results from the Global Burden of Disease Study 2021

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Burden of digestive congenital anomalies among children aged 0-14 years in 204 countries and territories, 1990-2021: results from the Global Burden of Disease Study 2021

Objectives We aim to delineate the digestive congenital abnormalities burden in children under 14 years old between 1990 and 2021.

Design We implemented data from the GBD 2021 database to evaluate digestive congenital abnormalities burden with different measures in 204 countries and territories from 1990 to 2021. We present precise estimations with 95% uncertainty intervals (UIs). In addition, we computed the estimated annual percentage change (EAPC) to examine the temporal patterns of these indicators.

Setting It utilizes prevalence, deaths, and disability-adjusted life years (DALYs) data from the Global Burden of Disease Study (GBD) to analyze this issue.

Participants Patients with digestive congenital abnormalities diagnosis.

Outcomes Total numbers, age-standardized rates of prevalence, mortality and DALYs, and their EAPCs were the main outcomes among children aged 0-14 years.

Results

In 2021, 2206.79 thousand prevalent cases were reported worldwide, with digestive congenital anomalies accounting for 47.16 thousand deaths and 4324.56 thousand DALYs among children aged 0-14 years. Digestive congenital anomalies prevalence was mitigated by 8.15% between 1990 and 2021, with the global age-standardized rate of prevalence declining to 40.09 per 100 000. Digestive congenital anomalies mortality was mitigated by 35.35% between 1990 and 2021, with an age-standardized rate of deaths declining to 0.77 per 100 000. The worldwide burden of digestive congenital anomalies decreased by 34.96% in terms of DALYs from 1990 to 2021, with an age-standardized rate of 70.44 DALYs per 100 000 population. There was a significant hindrance in the prevalence, particularly among older children. The likelihood of digestive congenital abnormalities peaked during infancy (2–4 years) in all regions.

Conclusion

We highlight promising global declines in the digestive congenital anomalies burden among children over the last 32 years. Prevalence, deaths, and DALYs associated with these anomalies have shown consistent decreases, although regional variations persist. These findings offer crucial insights for shaping effective prevention and management strategies for pediatric digestive congenital anomalies.

Data availability statement

Herein, we investigated datasets that are accessible to the public. The data is available from the following source: The Global Burden of Disease (GBD) Study 2021, accessible at http://ghdx.healthdata.org.

Strengths and limitations of this study

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This study uses comprehensive data from the Global Burden of Disease Study 2021.

The analysis covers a period of 32 years about digestive congenital anomalies, providing long-term trends.

One of the limitations is that within the GBD database, the availability and quality of data varied by location and time.

Another limitation is the significant heterogeneity among countries in terms of disease definitions, diagnoses, healthcare services, coding practices, and cultural factors, which may affect disease estimates.

The third limitation is that broad exposure measures like the SDI may not fully capture the social complexities within countries.

Introduction

Based on prior research on the Global Burden of Disease (GBD) data, congenital birth abnormalities are the fourth prevailing cause of mortality among children under the age of 5, encompassing around 10% of all deaths within this age group [1]. According to the World Health Organization (WHO), the estimated worldwide occurrence of congenital abnormalities varies between 1% and 5%, based on the region and the particular population under investigation [2]. While the overall death rate linked to congenital defects is declining, congenital malformations account for roughly 17% to 42% of newborn mortalities [3]. Digestive congenital anomalies are a common group of serious conditions that significantly impact the health of children. These abnormalities can occur at any point along the digestive tract, from the esophagus to the anus. The types of diseases are diverse, including esophageal atresia, duodenal atresia or stenosis, and anorectal atresia and stenosis, among others [4]. Congenital malformations in the digestive system might result in death if not promptly treated with surgery. Therefore, a multidisciplinary approach is necessary to ensure appropriate therapy for these disorders [5]. Typically, children who have congenital defects affecting their digestive system are prone to have delays in their development, issues with eating, and other concerns. Feeding difficulties in newborns may result from challenges in swallowing or digesting food, while delayed or mitigated gastrointestinal digestive function could cause problems, including constipation, diarrhea, and different digestive concerns. Consequently, these problems might lead to malnutrition and an inability to thrive. Moreover, surgical intervention for congenital defects affecting the digestive system might also have an influence on a child's growth and development[6].

An analysis of very underweight newborns found that the most common forms of congenital defects were associated with the digestive system (31.7%) and the heart (27.7%)[7]. Between 2008 and 2012, the European Surveillance of Congenital Anomalies (EUROCAT) reported a rate of 2.1 instances per 10,000 live births for significant congenital gastrointestinal abnormalities. Anorectal abnormalities, such as anal atresia and/or stenosis, were the most prevalent subgroup. This was followed by esophageal atresia with or without tracheoesophageal fistula, diaphragmatic hernia, Hirschsprung disease, and duodenal atresia or stenosis[8]. Gastroschisis (GS) and omphalocele (OC) are the two most often congenital abnormalities of the abdominal wall. The prevalence of GS is around 4.5 per 10,000 live births, whereas the OC incidence ranges from 0.6 to 4.8 per 10,000 live births. In contrast to other congenital anomalies, there has been an increasing occurrence of GS in

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recent years[9]. GS is often an isolated abnormality, and the prognosis is influenced by the overall condition of the prolapsed bowel loops. On the contrary, OC is often linked to different abnormalities encompassing chromosomal or cardiac anomalies, as well as syndromes encompassing pentalogy of Cantrell and Beckwith-Wiedemann syndrome[10]. There is a potential link between the occurrence of abdominal wall abnormalities and maternal smoking, with a positive correlation. Conversely, there is a negative correlation between the occurrence of these defects and maternal age and socioeconomic position [11].

Currently, there are studies focusing specifically on digestive congenital anomalies in certain countries, including one from South Korea [12] and another from Malaysia [13]. So, there is a lack of additional relevant research that provides information on the worldwide status of this disease. The GBD study is an accessible database that offers a systematic scientific evaluation of the global occurrence and implication on the life quality of 369 conditions measured in disability-adjusted life-years (DALYs)[14]. We aim to use the latest GBD dataset from 1990 to 2021 to understand the global disease burden of digestive congenital anomalies. These findings will support and strengthen the theoretical basis for personalized intervention strategies tailored to the needs of national healthcare systems and individual patients. The outcomes of our investigation will improve our comprehension of the burden and aid in the creation of efficient approaches for the prevention and management of this condition.

Methods

Study data

The statistics on congenital malformations of the digestive system from 1990 to 2021 were acquired from the Global Health Data website (https://vizhub.healthdata.org/gbd-results/). All statistics as values coupled with 95% uncertainty intervals (UI) derived from 100,000 simulations were presented with the GBD 2021 research. The data for analysis was selected based on the following selection criteria. The research period was initially established as 1990–2021. Furthermore, the location name was established to incorporate "Global," "the 21 geographic locations", "sociodemographic index (SDI) areas," and "the 204 countries or territories"[15]. Furthermore, the reason was determined to be "digestive congenital anomalies. " The assessment index for measuring the burden of digestive congenital abnormalities was determined to be the “prevalence,” “deaths,” and “DALYs.” Ultimately, the age variable was divided into five distinct categories: less than 1 year, 2 to 4 years, 5 to 9 years, 10 to 14 years, and 0 to 14 years.

Definitions

Age-standardized rate (ASR) [16]

ASR used the GBD 2021 global age standard population as its foundation. The ASR of this research primarily encompassed ASR of prevalence and DALYs.

Disability-adjusted life-years (DALYs)

In the GBD 2021 project, the worldwide syphilis burden was assessed with DALYs, which is a metric that integrates the number of years lived with a disability and the number of years lost [16].

Sociodemographic index (SDI)

The SDI is a composite measure that indicates the level of economic and social advancement. It is derived from factors such as education, average income, and overall fertility rate under the age of

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25[17]. In the GBD 2021, countries and territories were categorized into five quintiles based on their SDI: low, low-middle, middle, high-middle, and high [18].

Estimated annual percentage change (EAPC)

The EAPC and 95% confidence intervals (CI) were determined by calculating the average annual percentage change in ASR from 1990 to 2021. An increasing trend in the ASR was determined if both the EAPC and the lower 95% CI limit were positive. On the other hand, if both the EAPC and the upper 95% CI limit were negative, the ASR was deemed to have a declining trend. However, ASR was considered to be consistently stable throughout time.

Statistical analysis

The data were obtained from the GBD database and analyzed with R software version 4.3.3 (https://www.R-project.org/). Subgroup analysis was conducted based on sex, age, SDI, 21 geographic locations, and 204 countries.

Results

Global level

In 2021, 2206.79 thousand recorded instances of digestive congenital abnormalities worldwide, as shown in Table 1. The age-standardized point prevalence was 45.09 per 100,000, which is a drop of 8.15% compared to 1990. In 2021, there were 47.16 thousand fatalities caused by digestive congenital abnormalities, with an ASR of 0.77. This is a reduction of 35.35% compared to 1990 (table 2). The worldwide number of DALYs for digestive congenital abnormalities in 2021 was 4324.56 thousand, with an ASR of 70.44 DALYs per 100,000. This represents a 34.96% reduction compared to 1990 (table 3).

Regional level

In 2021, Tropical Latin America (86.52), Andean Latin America (68.49), and Caribbean (67.86) possessed the greatest age-standardized point prevalence for digestive congenital anomalies (per 100000), whereas Australasia（28.28）, Central Europe (36.23), and South Asia (39.49) had the lowest (table 1). Western Sub-Saharan Africa (1.58), Caribbean (1.27), and Central Latin America (1.03) experienced the greatest age-standardized death rates from digestive congenital anomalies in 2021, with the lowest rates in High-income Asia Pacific (0.15), Australasia (0.15), and Western Europe (0.18) (table 2). In 2021, Western Sub-Saharan Africa (140.99), Caribbean (116.09), and Central Latin America (93.06) experienced the greatest age-standardized DALYs per 100,000. On the other hand, Australasia (14.24), High-income Asia Pacific (14.75), and Western Europe (18.35) had the lowest rate (table 3). Tables S1-S3 show the age-standardized point prevalence, mortality, and DALY rates of digestive congenital abnormalities, respectively, categorized by gender in the year 2021. These tables include data from all regions and countries that comprise the GBD research. The prevalence, deaths, and DALY rates due to digestive congenital anomalies have shown a decreasing trend across all regions and countries worldwide.

The largest decreases in the age-standardized point prevalence of digestive congenital anomalies from 1990 to 2021 were found in Central Sub-Saharan Africa (-18.82%), Eastern Sub-Saharan Africa (-17.39%), and Central Europe (-16.3%), with the greatest increases in Southern Latin America (38.05%), Central Latin America (11.16%), and Andean Latin America (10.09%) (table 1). In the same period, all regions showed a decrease in the age-standardized death rates from digestive congenital anomalies, with the largest decreases in Central Europe (−74.11%), Eastern

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Europe (−72.05%), and Australasia (−71.45%) (table 2). The age-standardized DALYs decreased in all regions from 1990 to 2021, with the largest decreases in Central Europe (−72.99%), Eastern Europe (−71.04%), and Australasia (−69.76%) (table 3).

National level

In 2021, the national age-standardized point prevalence of digestive congenital anomalies spanned from 36.6 to 54.2 instances per 100000. Brazil (86.7), Plurinational State of Bolivia (86.2), and the Cuba (83.4) possessed the greatest age-standardized point prevalences of digestive congenital anomalies, with Australia (24.6), Czechia (27.8), and Montenegro (29.1) having the lowest estimates (figure 1 and table S1). In 2021, the national age-standardized mortality rates for digestive congenital abnormalities ranged from 0.6 to 1 death per 100,000 people. The highest rates were seen in Burkina Faso (2.0), Haiti (1.9), Bolivia (1.8), Mali (1.8), Nigeria (1.8), Sierra Leone (1.8), and South Sudan (1.8), whereas the lowest rates were found in Northern Mariana Islands (0.05), Estonia (0.1), Andorra (0.1), and Luxembourg (0.1) (figure 2 and table S2). In 2021, the national age-standardized DALYs of digestive congenital anomalies ranged from 53.1 to 87.6 patients per 100000. The highest rates were seen in Burkina Faso (174.5), Haiti (169.4), and Bolivia (166.3), whereas the lowest rates were in American Samoa (9.0), Latvia（9.2）, and Slovenia (9.2) (table S3). The age-standardized point prevalence had significant variations in percentage change from 1990 to 2021 across different countries. Notably, Turkmenistan, Seychelles, and Chile had the highest increases, with percentages of 48.1%, 44.2%, and 40.9% respectively. On the other hand, the Norway, Czechia, and Slovenia experienced the largest hindrances, with percentages of -40%, -35.7%, and -32.5%, respectively (table S1). Tokelau, Niue, and Guatemala exhibited the most increases in the age-standardized death rate over the same time, with percentages of 226.3%, 182.5%, and 103.8%, respectively. Conversely, Iran, Estonia, and Czechia had the biggest declines in the death rate, with percentages of -88.3%, -87.8%, and -87.2% respectively (table S2). Tokelau (209.4%), Niue (169.9%), and Guatemala (103.4%) had the largest increases in age-standardized DALY rate of DACs from 1990 to 2021. In contrast, the greatest decreases during the study period were found in Iran (−87.3%), Czechia (−85.8%), and Estonia (−85.6%) (table S3).

Age and sex patterns

In 2021, the point occurrence of digestive congenital abnormalities started to rise in the <1 year group worldwide, with the highest incidence observed in children aged 2-4 years. Likewise, the number of existing instances was most abundant in the 2-4 years age group but thereafter declined as age increased. The prevalence was greater in males across all age groups (figure 3).

Association with the SDI

We observed a horizontal S-shaped connection between the SDI and the age-standardized DALYs of digestive congenital abnormalities at the regional level, spanning from 1990 to 2021. The age-standardized DALYs exhibited exponential growth as the SDI climbed, reaching a peak at around 0.4, before which they declined. From 1990 to 2021, Western Sub-Saharan Africa, North Africa, the Middle East, and Eastern Sub-Saharan Africa experienced a larger number of DALYs than what was anticipated based on their SDI. Conversely, Australasia, High-income North America, High-income Asia Pacific, and Western Europe had lower-than-anticipated burdens from 1990 to 2021 (figure 4).

In 2021, the digestive congenital abnormalities burdens declined as socioeconomic development increased at the country level until reaching an SDI of around 0.25. However, after that point, the prevalence started to fall again until reaching an SDI of about 0.6 (figure S1). Several countries and

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territories, including Burkina Faso, Mali, South Sudan, and Chad, had much larger burdens than anticipated. Conversely, the Northern Mariana Islands, Estonia, and Andorra had considerably lower burdens than projected (figure S1).

Discussion

Digestive congenital anomalies worldwide constitute a broad topic involving medical, public health, and societal issues. These malformations refer to structural abnormalities in the digestive system present at birth, which can affect the development and function of organs such as the esophagus, stomach, small intestine, large intestine, anus, and other related organs[19], including conditions like esophageal atresia [20], biliary atresia [21], and Hirschsprung disease [22].

The incidence of digestive congenital anomalies in children varies significantly worldwide, attributed in part to interactions among genetic, environmental, and nutritional factors. Regarding genetic factors, chromosomal abnormalities such as Down syndrome are associated with higher rates of upper gastrointestinal tract malformations[23]. Gene mutations are also associated with Hirschsprung disease [24]. Environmental factors such as exposure to drugs and toxins, such as certain medications and chemicals, can increase the risk of malformations. Research has shown that maternal exposure to drugs during pregnancy[25], such as antidepressants, can lead to digestive congenital anomalies [26]. Maternal exposure to pesticides or active/passive smoking during pregnancy can also increase the risk of birth defects [27]. Some studies indicate that pesticide exposure throughout pregnancy is a risk factor for neuroblastoma in infants [28-29]. Infections during pregnancy, particularly viral infections like cytomegalovirus, rubella virus, Zika virus, and others in early pregnancy, can potentially cause fetal malformations [30]. Research has shown that maternal infections during pregnancy can increase the risk of biliary atresia [31]. Nutritional factors also play a crucial role, with maternal malnutrition, such as folate deficiency, being linked to neural tube defects and congenital heart diseases[32]. A prospective investigation in Norway demonstrated that prenatal supplementation with folic acid and multivitamins can reduce the incidence of infant abdominal wall defects[33].

In developed countries, advancements in preventive measures and medical technology have significantly improved the ability to diagnose and treat congenital malformations, leading to higher survival rates among affected children[34]. However, in some developing countries, these medical conditions are poorer, leading to significant global disparities between North and South. These differences are evident not only in incidence and mortality rates but also in patient prognosis and quality of life. Treating congenital digestive tract malformations is typically a complex process requiring multidisciplinary collaboration, including pediatrics, surgery, nutrition, and rehabilitation medicine. Even within the same country, there are differences across various regions[13].Early diagnosis and treatment are crucial for improving the life quality and increasing survival rates of impacted children[35], whereas delayed treatment may result in long-term malnutrition, developmental delays, and other complications. With advancements in technology and increased global health awareness, there has been growing attention and research focused on digestive congenital anomalies. Driven by global health agendas, many countries and organizations are committed to improving child health, particularly in the early detection and treatment of congenital diseases.

Limitations

Our study, however, has its limitations. First, within the GBD framework, the availability and quality of data vary by location and time. Incomplete vital registration systems, erroneous cause-of-

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death coding, and missing data can introduce potential biases. Despite extensive corrections, these issues may still affect statistical outcomes. Second, there is significant heterogeneity among countries regarding disease definitions, diagnoses, healthcare services, coding practices, and cultural factors, which may impact disease estimates. Furthermore, generalized exposure measures like the SDI may not fully capture the social complexities within countries. In conclusion, while this study provides valuable insights into the global burden of digestive congenital anomalies using GBD database, caution is warranted when interpreting its findings due to the aforementioned limitations. Therefore, further research is necessary to address these gaps and to achieve a more comprehensive understanding of global disease burden trends and determinants.

Conclusion

In summary, according to our study of the GBD 2021 database, the prevalence, deaths, and DALYs of digestive congenital anomalies in the global population aged 0-14 years are generally declining, reflecting ongoing progress worldwide. Digestive congenital anomalies worldwide represent a complex and diverse issue that requires attention and support from society as a whole. The technological advancements and the formulation of public health policies via international collaboration, we can provide better treatment and management for patients, thereby improving their quality of life.

Abbreviations

DALYs: Disability-adjusted life years
GBD: Global burden of disease
SDI: Socio-demographic index
EAPC: Estimated annual percentage changes
ASR: Age-standardized rate
CI: Confidence interval
UI: Uncertainty intervals

Ethics approval and consent to participate

The research involving people did not need ethical clearance since it complied with local law and institutional regulations. Participants and their legal guardians/next of kin were not needed to provide written informed permission to participate in this research, as per national law and institutional standards.

Consent for publication

Not applicable.

Data availability statement

Herein, we investigated datasets that are accessible to the public. The data is available from the following source: The Global Burden of Disease (GBD) Study 2021, accessible at http://ghdx.healthdata.org.

Competing interests

None of the authors declares a conflict of interest.

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Author contributions

Xi Luo, Jie Luo, Jinhua Zhao and Jun Du designed the study. Xi Luo and Jie Luo gathered the data. Xi Luo and Jie Luo examined the data. Xi Luo wrote the manuscript. Huajian Gu and Deqin Lu contributed significant intellectual input and gave their approval for the final version to be published. Every author made contributions to the paper and gave their approval to the submitted version. Xi Luo is responsible for the overall content (as guarantor).

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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Table 1: Prevalent cases for digestive congenital anomalies among aged 0-14 years in 2021, the percentage change in age-standardized rates (ASRs) per 100000, and EAPC by Global Burden of Disease region, from 1990 to 2021 (generated from data available at https://vizhub.healthdata.org/gbd-results/)

	Prevalence (95% UI)			
	No, in thousands (95% UI)	**ASRs per 100 000 (95% UI)**	**Percentage change in ASRs from 1990 to 2021**	**EAPC (1990–2021) (95% UI)**
Global	2206.79 (1734.74 to 2735.1)	45.09 (36.64 to 54.19)	-8.15 (-14.04 to -1.8)	-0.27 (-0.32 to -0.23)
High-income Asia Pacific	24.06 (19.02 to 29.12)	48.56 (39.22 to 57.38)	-3.48 (-8.82 to 2.6)	-0.06 (-0.21 to 0.09)
High-income North America	68.6 (55.33 to 83.42)	47.04 (39.49 to 54.44)	-6.4 (-13.89 to 1.88)	-0.07 (-0.15 to 0.01)
Western Europe	78.19 (63.87 to 94.89)	51.54 (42.75 to 61.21)	-8.17 (-13.16 to -3.71)	-0.32 (-0.34 to -0.3)
Australasia	3.98 (3.11 to 4.89)	28.28 (22.96 to 33.56)	-5.94 (-15.04 to 3.87)	-0.53 (-0.63 to -0.43)
Andean Latin America	29.54 (23.13 to 37.63)	68.49 (54.93 to 83.79)	10.19 (-0.71 to 23.29)	0.27 (0.18 to 0.36)
Tropical Latin America	107.38 (86.11 to 132.64)	86.52 (70.56 to 103.38)	-7.68 (-16.5 to 2.16)	-0.25 (-0.28 to -0.21)

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Central Latin America	81.46 (65.23 to 98.93)	54.26 (44.66 to 64.09)	11.16 (3.07 to 20.64)	0.32 (0.22 to 0.43)
Southern Latin America	18.27 (14.28 to 22.31)	52.54 (42.72 to 62.11)	38.05 (22.34 to 56.25)	0.92 (0.76 to 1.08)
Caribbean	19.3 (15.23 to 24.06)	67.86 (55.53 to 81.41)	-11.15 (-18.02 to -4.66)	-0.41 (-0.48 to -0.33)
Central Europe	15.63 (12.26 to 19.01)	36.23 (29.74 to 42.78)	-16.3 (-21.91 to -9.85)	-0.56 (-0.6 to -0.53)
Eastern Europe	37.63 (29.96 to 46.25)	47.5 (38.41 to 56.18)	-7.63 (-12.38 to -2.63)	-0.29 (-0.38 to -0.21)
Central Asia	39.57 (31.18 to 49.68)	58.77 (47.54 to 70.44)	9.98 (1.59 to 18.99)	0.39 (0.34 to 0.44)
North Africa and Middle East	212.13 (167.12 to 262.39)	50.57 (40.88 to 59.51)	-10.55 (-18.88 to -2.04)	-0.41 (-0.46 to -0.37)
South Asia	470.43 (364.27 to 595.31)	39.49 (31.32 to 48.78)	-11.43 (-20.06 to -1.83)	-0.32 (-0.4 to -0.25)
Southeast Asia	169.27 (133.05 to 209.26)	40.47 (32.89 to 48.29)	-2.48 (-11.28 to 7.3)	-0.14 (-0.18 to -0.09)
East Asia	277.1 (209.16 to 345.5)	40.06 (31.76 to 48.82)	-10.47 (-20.82 to 3.17)	-0.2 (-0.29 to -0.12)
Oceania	5.3 (4.08 to 6.75)	41.59 (33.21 to 51.15)	7.53 (-1.71 to 19.49)	0.18 (0.08 to 0.27)
Western Sub-Saharan Africa	269.66 (207.96 to 334.32)	48.18 (38.88 to 57.8)	-4.58 (-11.78 to 3.72)	-0.26 (-0.35 to -0.17)
Eastern Sub-Saharan Africa	194.24 (152.15 to 242.44)	43.2 (35.14 to 52.54)	-17.39 (-24.99 to -8.04)	-0.6 (-0.66 to -0.53)
Central Sub-Saharan Africa	61.89 (48.28 to 78.81)	42.45 (34.53 to 51.86)	-18.82 (-29.16 to -6.85)	-0.76 (-0.85 to -0.67)
Southern Sub-Saharan Africa	23.17 (18.29 to 28.69)	41.74 (33.86 to 49.87)	2.48 (-4.34 to 11.58)	0.14 (0 to 0.27)

95% UI=95% uncertainty intervals.

Table 2: Deaths for digestive congenital anomalies among aged 0-14 years in 2021, the percentage change in age-standardized rates (ASRs) per 100000, and EAPC by Global Burden of Disease region, from 1990 to 2021 (generated from data available at https://vizhub.healthdata.org/gbd-results/)

	Deaths (95% UI)			
	No, in thousands (95% UI)	**ASRs per 100 000 (95% UI)**	**Percentage change in ASRs from 1990 to 2021**	**EAPC (1990–2021) (95% UI)**

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Global	47.16 (35.18 to 59.03)	0.77 (0.58 to 0.96)	-35.35 (-57.49 to 16.74)	-1.26 (-1.31 to -1.2)
High-income Asia Pacific	0.08 (0.06 to 0.11)	0.15 (0.11 to 0.2)	-68.46 (-79.51 to -53.29)	-3.4 (-3.65 to -3.15)
High-income North America	0.41 (0.32 to 0.49)	0.22 (0.17 to 0.26)	-33.36 (-53.44 to -20.95)	-0.79 (-0.97 to -0.6)
Western Europe	0.34 (0.28 to 0.42)	0.18 (0.15 to 0.22)	-63.49 (-73.63 to -53.63)	-2.99 (-3.13 to -2.86)
Australasia	0.02 (0.02 to 0.04)	0.15 (0.11 to 0.23)	-71.45 (-78.39 to -59.18)	-3.67 (-3.96 to -3.39)
Andean Latin America	0.59 (0.41 to 0.78)	1.01 (0.71 to 1.34)	-48.04 (-71.69 to 7.32)	-1.57 (-1.73 to -1.41)
Tropical Latin America	1.29 (1.02 to 1.64)	0.81 (0.64 to 1.01)	-21.46 (-44.19 to 8.6)	-0.16 (-0.59 to 0.27)
Central Latin America	1.89 (1.4 to 2.46)	1.03 (0.77 to 1.33)	-8.57 (-39.06 to 27.09)	0 (-0.14 to 0.14)
Southern Latin America	0.24 (0.18 to 0.3)	0.64 (0.48 to 0.8)	-33.82 (-52.08 to -12.47)	-1.15 (-1.35 to -0.95)
Caribbean	0.48 (0.28 to 0.77)	1.27 (0.75 to 2.03)	-31.65 (-54.14 to 11.32)	-1.02 (-1.2 to -0.83)
Central Europe	0.14 (0.11 to 0.18)	0.28 (0.22 to 0.35)	-74.11 (-83.17 to -61.55)	-4.24 (-4.41 to -4.08)
Eastern Europe	0.29 (0.21 to 0.38)	0.34 (0.25 to 0.45)	-72.05 (-81.14 to -58.57)	-4.65 (-5.04 to -4.26)
Central Asia	0.6 (0.48 to 0.77)	0.62 (0.49 to 0.8)	-21.41 (-40.02 to 6.22)	-0.67 (-0.99 to -0.35)
North Africa and Middle East	4.2 (2.87 to 5.52)	0.74 (0.5 to 0.97)	-62.97 (-78.95 to -10.76)	-2.96 (-3.04 to -2.88)
South Asia	9.51 (5.32 to 15.99)	0.64 (0.37 to 1.08)	-34.19 (-63.5 to 49.35)	-1.11 (-1.22 to -1)
Southeast Asia	3.3 (2.19 to 4.52)	0.62 (0.41 to 0.85)	-31.27 (-59.27 to 61)	-1.25 (-1.33 to -1.17)
East Asia	2.45 (1.53 to 3.64)	0.43 (0.27 to 0.64)	-65.73 (-84.05 to -19.77)	-3.9 (-4.08 to -3.72)
Oceania	0.06 (0.02 to 0.14)	0.29 (0.11 to 0.71)	-4.73 (-43.78 to 55.25)	-0.15 (-0.34 to 0.04)
Western Sub-Saharan Africa	12.74 (7.89 to 17.46)	1.58 (1.01 to 2.17)	-20.1 (-44.56 to 76.76)	-0.39 (-0.5 to -0.27)
Eastern Sub-Saharan Africa	6.52 (3.51 to 10.59)	1.02 (0.59 to 1.66)	-39.48 (-65.46 to 59.58)	-1.3 (-1.43 to -1.18)
Central Sub-Saharan Africa	1.62 (0.86 to 2.83)	0.78 (0.43 to 1.36)	-50.4 (-71.5 to 25.5)	-2.07 (-2.21 to -1.93)
Southern Sub-Saharan Africa	0.39 (0.21 to 0.62)	0.52 (0.29 to 0.83)	-18.18 (-47.53 to 15.54)	-0.61 (-0.75 to -0.48)

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95% UI=95% uncertainty intervals.

Table 3: DALYs for digestive congenital anomalies among aged 0-14 years in 2021, the percentage change in age-standardized rates (ASRs) per 100000, and EAPC by Global Burden of Disease region, from 1990 to 2021 (generated from data available at https://vizhub.healthdata.org/gbd-results/)

	DALYs (95% UI)			
	No, in thousands (95% UI)	**ASRs per 100 000 (95% UI)**	**Percentage change in ASR s from 1990 to 2021**	**EAPC (1990–2021) (95% UI)**
Global	4324.56 (3246.58 to 5390.46)	70.44 (53.14 to 87.6)	-34.96 (-57.06 to 15.48)	-1.24 (-1.29 to -1.19)
High-income Asia Pacific	8.16 (6.28 to 10.85)	14.75 (11.46 to 19.35)	-65.6 (-77.02 to -50.89)	-3.14 (-3.36 to -2.91)
High-income North America	40.1 (31.73 to 47.45)	21.68 (17.25 to 25.44)	-31.79 (-51.19 to -20.16)	-0.74 (-0.92 to -0.57)
Western Europe	34.49 (28.94 to 42.73)	18.35 (15.45 to 22.59)	-60.66 (-71.23 to -51.22)	-2.78 (-2.92 to -2.65)
Australasia	2.35 (1.83 to 3.51)	14.24 (11.25 to 21.14)	-69.76 (-76.79 to -57.84)	-3.53 (-3.79 to -3.26)
Andean Latin America	53.93 (38.13 to 71.83)	92.32 (65.51 to 122.41)	-47.44 (-71.19 to 7.27)	-1.54 (-1.7 to -1.38)
Tropical Latin America	120.66 (95.77 to 151.6)	74.54 (59.73 to 92.91)	-21.61 (-43.62 to 6.67)	-0.19 (-0.61 to 0.23)
Central Latin America	172.87 (128.91 to 224.32)	93.06 (69.56 to 120.37)	-8.58 (-38.73 to 26.53)	-0.01 (-0.14 to 0.13)
Southern Latin America	22.12 (16.98 to 27.67)	59.39 (45.76 to 74.21)	-32.51 (-50.78 to -11.39)	-1.1 (-1.3 to -0.9)
Caribbean	43.69 (26.14 to 69.73)	116.09 (70.06 to 184.27)	-31.12 (-53.54 to 11.44)	-0.99 (-1.17 to -0.82)
Central Europe	13.28 (10.44 to 16.54)	26.49 (20.89 to 32.86)	-72.99 (-82.12 to -60.39)	-4.12 (-4.27 to -3.96)
Eastern Europe	27.42 (20.62 to 36.02)	31.88 (24.29 to 41.44)	-71.04 (-80.14 to -57.73)	-4.54 (-4.91 to -4.16)
Central Asia	55.81 (44.31 to 71.01)	57.85 (46.1 to 73.44)	-20.36 (-38.8 to 6.4)	-0.63 (-0.93 to -0.33)
North Africa and Middle East	385.82 (268.91 to 506.2)	67.85 (47.56 to 88.75)	-62.35 (-78.36 to -10.86)	-2.91 (-2.99 to -2.83)
South Asia	875.77 (498.39 to 1459.05)	58.84 (33.86 to 97.43)	-33.89 (-63.13 to 47.19)	-1.1 (-1.21 to -0.99)
Southeast Asia	303.11 (203.61 to 413.26)	56.7 (38.26 to 77.26)	-30.64 (-58.62 to 58.94)	-1.22 (-1.3 to -1.14)

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East Asia	232.39 (148.76 to 340.92)	40.15 (25.59 to 59.03)	-64.86 (-83.36 to -19.65)	-3.81 (-3.98 to -3.63)
Oceania	5.44 (2.14 to 13.12)	28.02 (11.77 to 65.82)	-4.07 (-41.76 to 51.97)	-0.13 (-0.31 to 0.05)
Western Sub-Saharan Africa	1151.28 (718.89 to 1575.46)	140.99 (88.96 to 192.78)	-20.05 (-44.28 to 76.91)	-0.38 (-0.5 to -0.27)
Eastern Sub-Saharan Africa	592 (325.22 to 955.78)	92.69 (52.8 to 148.72)	-39.22 (-64.98 to 56.04)	-1.29 (-1.41 to -1.17)
Central Sub-Saharan Africa	148.02 (79.98 to 256.28)	71.28 (39.19 to 122.63)	-50.1 (-70.99 to 21.87)	-2.06 (-2.2 to -1.92)
Southern Sub-Saharan Africa	35.85 (20.28 to 56.53)	47.51 (27.27 to 74.32)	-18.12 (-46.68 to 14.53)	-0.61 (-0.74 to -0.48)

95% UI=95% uncertainty intervals.

Figure Legends

Figure 1 | Age-standardized point prevalence of digestive congenital anomalies per 100 000 population in 2021 by country (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Figure 2 | Age-standardized death rate of digestive congenital anomalies per 100 000 population in 2021 by country (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Figure 3 | Number of prevalent cases globally and prevalence of digestive congenital anomalies per 100,000 population by age and sex in 2021. The lines represent the most common instance, along with a 95% range of uncertainty, for both male and female (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Figure 4 | Age-standardized DALYs of digestive congenital anomalies for the 21 Global Burden of Disease regions by SDI, 1990–2021. Each region is represented by thirty-two data points, which display the age-standardized DALYs recorded from 1990 to 2021 for that specific region. The solid line represents the expected values, which are determined by considering the SDI and disorder rates in all areas. (generated from data available at https://vizhub.healthdata.org/gbd-results/)

Figure S1 | Age-standardized DALYs of digestive congenital anomalies for the 204 countries and territories by SDI, in 2021. Expected values based on the Socio-demographic Index and disease rates in all locations are shown as the black line. Each point shows the observed age-standardized DALYs for each country in 2021 (generated from data available at https://vizhub.healthdata.org/gbd-results/)

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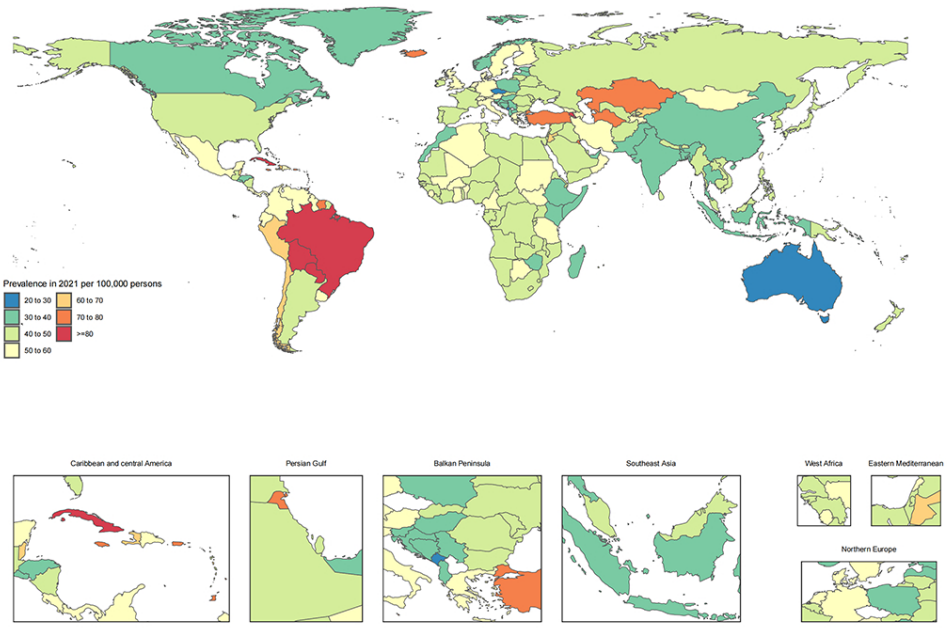

Age-standardized point prevalence of digestive congenital anomalies per 100 000 population in 2021 by country

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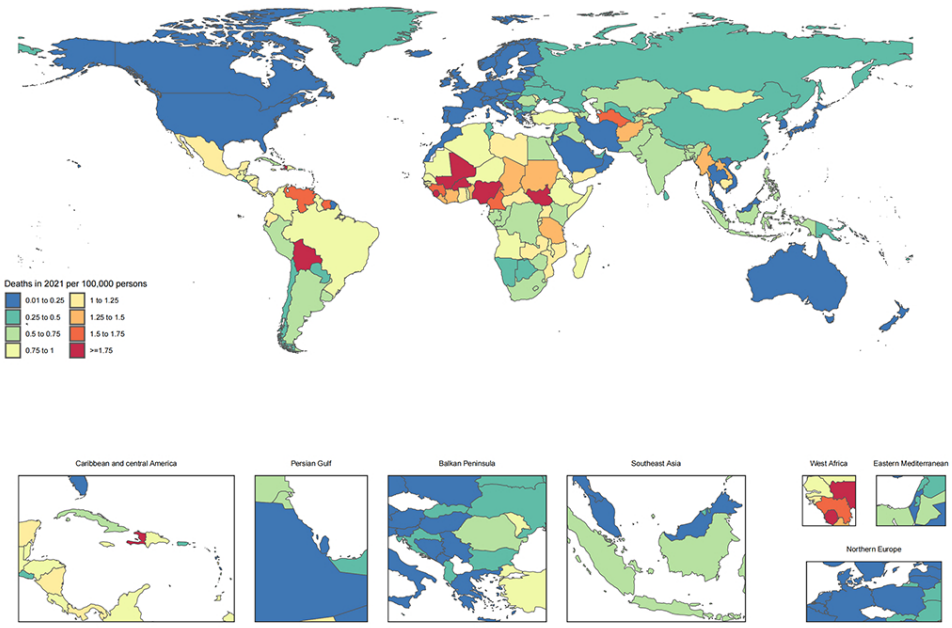

Age-standardized death rate of digestive congenital anomalies per 100 000 population in 2021 by country

90x66mm (300 x 300 DPI)

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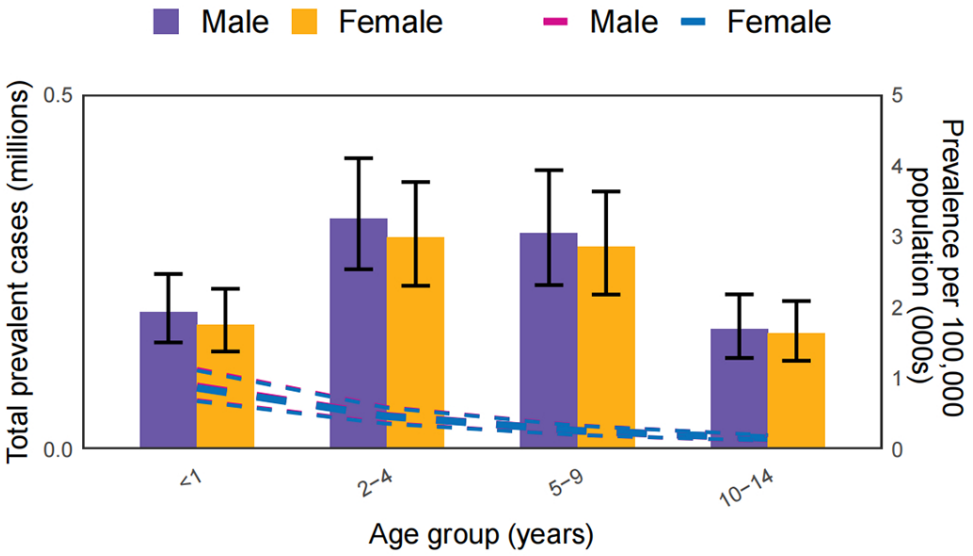

Number of prevalent cases globally and prevalence of digestive congenital anomalies per 100,000 population by age and sex in 2021. The lines represent the most common instance, along with a 95% range of uncertainty, for both male and female.

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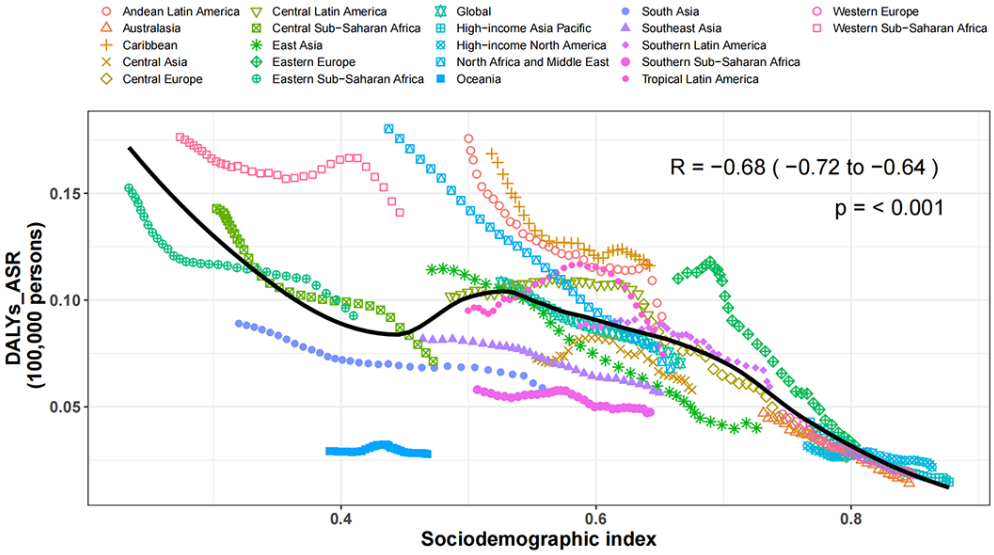

Age-standardized DALYs of digestive congenital anomalies for the 21 Global Burden of Disease regions by SDI, 1990–2021. Each region is represented by thirty-two data points, which display the age-standardized DALYs recorded from 1990 to 2021 for that specific region. The solid line represents the expected values, which are determined by considering the SDI and disorder rates in all areas.

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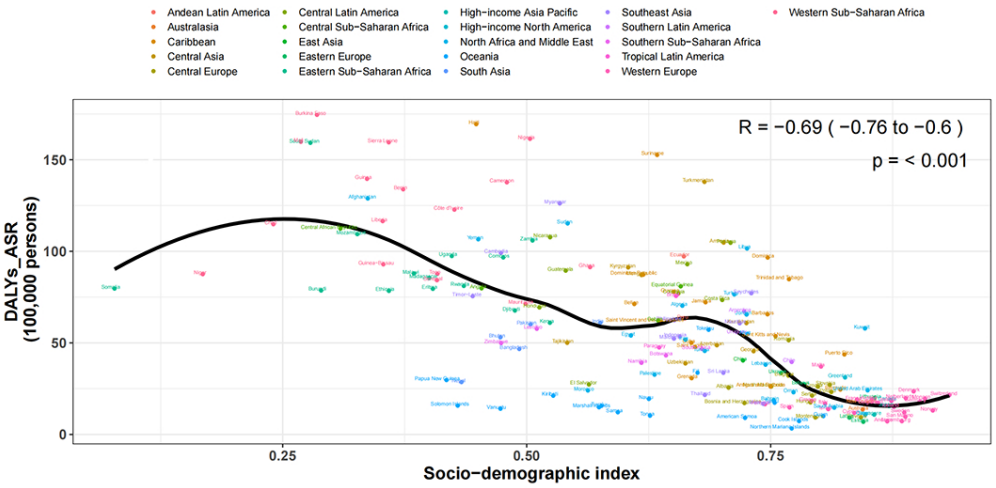

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Table S1: Prevalence due to digestive congenital anomalies in 1990-2021 among aged 0-14 years and the percentage change in the age-standardized rates (ASRs) per 100,000, by location (Generated from data available from https://vizhub.healthdata.org/gbd-results/)

	1990		2021		Percentage change in the ASRs per 100 000
	No(95%UI)	ASRs per 100 000 (95%UI)	No(95%UI)	ASRs per 100 000 (95%UI)	
Global	2239346 (1714221,2784993)	49.1 (39,59.2)	2206787 (1734739,2735104)	45.1 (36.6,54.2)	-8.2 (-14,-1.8)
Andean Latin America	23552 (17968,29676)	62.2 (49.9,75)	29545 (23129,37632)	68.5 (54.9,83.8)	10.2 (-0.7,23.3)
Plurinational State of Bolivia	6358 (4725,7767)	89.7 (70.6,107.9)	7010 (5379,8869)	86.2 (69.1,104.3)	-3.9 (-19.6,11.8)
Ecuador	4205 (3212,5493)	43.3 (34,53.9)	7531 (5867,9497)	60 (47.7,73.4)	38.5 (22.5,57.5)
Peru	12989 (9803,16767)	62.1 (48.8,76.1)	15003 (11761,19561)	66.7 (53.6,82.5)	7.4 (-7.8,26.7)
Australasia	3657 (2885,4543)	30.1 (24,36.6)	3981 (3112,4889)	28.3 (23,33.6)	-5.9 (-15,3.9)
Australia	2577 (2024,3297)	25.4 (20.1,31.4)	2879 (2243,3613)	24.6 (19.7,29.6)	-3.2 (-15.8,10.3)
New Zealand	1080 (846,1340)	52.2 (41.9,63.2)	1102 (881,1327)	46.3 (38.4,54.1)	-11.5 (-20.2,-1.2)
Caribbean	23657 (18466,29237)	76.4 (61.6,92.4)	19296 (15228,24061)	67.9 (55.5,81.4)	-11.2 (-18,-4.7)
Antigua and Barbuda	22 (17,27)	50.5 (39.9,61.6)	21 (16,26)	54.3 (44.1,65.8)	7.5 (-6.1,22.3)
Barbados	103 (79,129)	67.5 (53.6,81.5)	80 (63,100)	73.1 (58.9,89)	8.3 (-5.8,25)
Belize	143 (111,181)	65.4 (51.9,78.5)	182 (142,230)	63.6 (50.8,77.1)	-2.6 (-15.1,14.2)
Bermuda	17 (13,21)	58.9 (46,72.6)	9 (7,11)	51.6 (41.5,62.2)	-12.3 (-23.2,-1.1)
Commonwealth of the Bahamas	104 (81,130)	55.3 (43.9,66.1)	89 (70,112)	53.2 (43.3,64.2)	-3.8 (-13.3,9.7)
Cuba	7005 (5524,8742)	98.9 (79.7,120.3)	3583 (2736,4573)	83.4 (66.2,102.8)	-15.7 (-28.1,-1.8)
Dominica	33 (25,40)	54.5 (42.9,64.9)	20 (16,26)	67.8 (53.5,83.5)	24.4 (8.8,39.9)
Dominican Republic	4902 (3775,6171)	67.1 (53.5,82.3)	4260 (3266,5447)	58.5 (45.9,71.8)	-12.7 (-25.4,-0.1)
Grenada	41 (31,52)	50.4 (39.9,61.2)	25 (19,30)	51.2 (40.7,61)	1.7 (-11.3,16.9)

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Guyana	444 (339,559)	58.1 (47,70.4)	302 (237,381)	58.6 (47.2,71.3)	0.7 (-12.9,15.6)
Haiti	5639 (4168,7170)	73.6 (56.3,90.1)	7555 (5826,9416)	65.4 (53.2,79.1)	-11.2 (-23.5,3.6)
Jamaica	1631 (1250,2059)	74.3 (58.8,91.4)	968 (757,1192)	70.8 (56.7,84.7)	-4.7 (-16.1,9.5)
Puerto Rico	1647 (1279,2060)	68.4 (54.3,83.4)	705 (553,886)	74.8 (59.8,91)	9.4 (-3,25.3)
Saint Kitts and Nevis	19 (15,24)	55.8 (44.2,67.6)	13 (10,16)	57 (45.2,69.6)	2.2 (-9.5,16.4)
Saint Lucia	72 (56,91)	56.6 (45.5,69.3)	39 (30,49)	58.3 (46.3,70.4)	2.9 (-8.9,18.2)
Saint Vincent and the Grenadines	58 (44,73)	58 (46.2,70.9)	33 (26,42)	59.5 (47.9,72)	2.6 (-11.8,19.7)
Suriname	271 (210,336)	78.1 (62.2,94.8)	265 (209,324)	75.5 (61,90.7)	-3.3 (-16.5,11)
Trinidad and Tobago	656 (500,834)	65.5 (50.9,80.7)	477 (373,596)	75 (61,90.1)	14.4 (0,30.7)
United States Virgin Islands	49 (39,61)	63.5 (50.9,75.4)	16 (13,20)	58.1 (46.7,70.1)	-8.6 (-20.1,3.6)
Central Asia	34122 (26278,42831)	53.4 (42.7,64.5)	39566 (31183,49683)	58.8 (47.5,70.4)	10 (1.6,19)
Armenia	2429 (1883,3030)	82.5 (65.5,100.7)	1126 (870,1399)	80.2 (63.8,96.3)	-2.9 (-16.8,14.1)
Azerbaijan	3294 (2476,4189)	53.3 (42,66.3)	2943 (2257,3854)	55.1 (44.3,68.2)	3.3 (-9.8,17.3)
Georgia	1500 (1143,1884)	47.8 (37.9,57.9)	922 (742,1129)	53.7 (44.1,63.5)	12.4 (-4.5,32)
Kazakhstan	10096 (7732,12797)	73.5 (57.7,88.9)	10062 (7821,12766)	76.3 (61.2,91.9)	3.7 (-9.1,17.9)
Kyrgyzstan	2864 (2141,3652)	62.5 (48.2,77.3)	3602 (2820,4604)	62.7 (50.8,78)	0.3 (-13.8,17.3)
Mongolia	1351 (1039,1728)	56.3 (45.4,69.3)	1501 (1148,1948)	55 (43.3,67.8)	-2.4 (-16.3,11.3)
Tajikistan	2756 (2073,3540)	45 (35.6,55)	5587 (4243,7205)	57.4 (45.3,70.8)	27.4 (12.5,45)
Turkmenistan	2161 (1631,2737)	54 (43.2,66.8)	3239 (2469,4087)	79.9 (63.2,98)	48.1 (30.5,67.2)
Uzbekistan	7672 (5786,9729)	38.5 (30.4,47.6)	10585 (8297,13491)	46.1 (37.4,56.5)	19.7 (4.5,39.5)
Central Europe	33544 (26078,41552)	43.3 (34.7,52)	15626 (12263,19011)	36.2 (29.7,42.8)	-16.3 (-21.9,-9.9)
Albania	816 (615,1049)	28.8 (22.5,36.7)	409 (312,503)	37.6 (29.6,45.3)	30.6 (13.7,50.4)

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Bosnia and Herzegovina	928 (698,1152)	33.7 (26.6,40.9)	351 (265,443)	31.2 (24.6,38.1)	-7.3 (-18,5.5)
Bulgaria	2481 (1897,3058)	58 (46,70.2)	1066 (825,1342)	48.3 (39,58.5)	-16.7 (-26.8,-4.2)
Croatia	894 (725,1115)	36.7 (30,44.4)	540 (420,682)	37.7 (30.2,45.9)	2.6 (-12.1,18.9)
Czech Republic	2401 (1857,3011)	43.2 (34.1,53)	1099 (846,1362)	27.8 (22.3,33.2)	-35.7 (-43.8,-26.1)
Hungary	2443 (1909,3060)	45.5 (36.5,55.9)	1167 (911,1459)	34.4 (27.1,41.6)	-24.6 (-33.7,-14.1)
Montenegro	175 (133,224)	42.2 (33.1,51.5)	72 (55,91)	29.1 (22.7,35.4)	-30.9 (-39,-21.6)
North Macedonia	580 (440,722)	41.9 (32.8,51.5)	289 (227,364)	36.7 (29.7,44.5)	-12.4 (-24.3,1.4)
Poland	10181 (7626,12961)	38 (29.4,47.8)	4793 (3798,5859)	31.1 (25.5,37.2)	-18.1 (-25.5,-9)
Romania	7316 (5603,9262)	49.8 (39.7,61.8)	3410 (2662,4177)	45.9 (37,55)	-8 (-23.1,10.1)
Serbia	2901 (2236,3643)	51 (40.5,62.6)	1072 (827,1357)	39.2 (31,48)	-23.2 (-35.4,-8)
Slovakia	1375 (1051,1713)	40.8 (32,49.3)	897 (704,1111)	41.3 (33.4,49.8)	1.3 (-11.7,18.2)
Slovenia	516 (393,646)	49 (38.8,59.9)	234 (176,291)	33.1 (25.6,39.9)	-32.5 (-42.3,-19.2)
Central Latin America	81036 (63409,99625)	48.8 (39.4,58.7)	81462 (65228,98933)	54.3 (44.7,64.1)	11.2 (3.1,20.6)
Colombia	14619 (11511,18192)	49.1 (39.5,59.9)	15290 (11949,19103)	59.5 (48.7,71.6)	21 (8.9,36.9)
Costa Rica	1770 (1386,2220)	56.7 (45.3,69.5)	1344 (1062,1651)	55.4 (44.8,66.4)	-2.3 (-14.1,12.6)
El Salvador	1671 (1248,2111)	33.3 (26.4,40.7)	1411 (1078,1792)	35.2 (27.7,43)	5.5 (-7.9,19.8)
Guatemala	3620 (2680,4725)	35.8 (28.1,44.5)	4874 (3896,6065)	43.7 (35.5,52.4)	22.1 (3.8,45.1)
Honduras	1669 (1264,2134)	31.7 (24.8,38.7)	2546 (1993,3179)	35.2 (28.5,42.8)	11.2 (-1,24.2)
Mexico	45653 (35312,56059)	52.6 (41.9,62.9)	42443 (34117,51562)	56.6 (46.3,66.8)	7.8 (-1.2,18.8)
Nicaragua	2295 (1755,2860)	46.9 (36.8,57.6)	2290 (1773,2910)	47.3 (37.6,57.3)	0.8 (-12.6,15.2)
Panama	1092 (848,1369)	49.3 (39.2,60.7)	1514 (1177,1890)	53.2 (42.6,64.5)	7.9 (-5.1,23.7)
Bolivarian Republic of Venezuela	8648 (6620,11067)	47 (37.6,57.8)	9750 (7585,12134)	58.2 (46.7,71.7)	23.9 (6.8,47.2)

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Central Sub-Saharan Africa	37525 (27860,47582)	52.3 (40.5,64.4)	61894 (48279,78809)	42.4 (34.5,51.9)	-18.8 (-29.2,-6.8)
Angola	6646 (4967,8475)	49.3 (37.8,61.4)	17793 (13612,22040)	45.9 (37.1,54.9)	-6.9 (-20,8.8)
Central African Republic	1700 (1275,2210)	49.8 (38.9,61.4)	2689 (2067,3423)	45.2 (36.3,55.1)	-9.3 (-19.9,3)
Congo	1354 (1024,1715)	48.8 (38.5,59.1)	1925 (1472,2498)	42.9 (34,52.8)	-12.1 (-24.7,3.4)
Democratic Republic of the Congo	26968 (20031,34479)	53.5 (41.8,65.9)	38121 (29406,49419)	40.7 (32.5,50.8)	-23.9 (-36.4,-10.8)
Equatorial Guinea	253 (187,317)	46.2 (35.5,56.6)	649 (482,824)	48.7 (37.9,59.6)	5.3 (-10.6,22.6)
Gabon	604 (458,753)	54.2 (42.5,66.7)	717 (547,912)	47.7 (37.9,58.8)	-11.9 (-23.9,0.6)
East Asia	401675 (299906,509493)	44.7 (34.5,55.3)	277096 (209157,345501)	40.1 (31.8,48.8)	-10.5 (-20.8,3.2)
China	383719 (286325,487662)	44.1 (33.9,54.7)	269030 (202773,335797)	39.8 (31.4,48.6)	-9.8 (-20.6,4.5)
Democratic People's Republic of Korea	9352 (7101,11757)	56.8 (44.7,70.1)	4429 (3353,5463)	40.2 (31.8,48.7)	-29.2 (-38.7,-18.5)
Taiwan (Province of China)	8603 (6768,10687)	68 (55.1,81.8)	3637 (2971,4296)	58.1 (49.7,66.9)	-14.6 (-23.8,-2.9)
Eastern Europe	68360 (53787,84810)	51.4 (41.5,62.1)	37627 (29957,46245)	47.5 (38.4,56.2)	-7.6 (-12.4,-2.6)
Belarus	3094 (2321,3940)	49.7 (38.9,60.3)	1395 (1097,1739)	40.4 (32.5,48.6)	-18.7 (-29.4,-6.1)
Estonia	374 (285,470)	42.6 (33.1,51.6)	128 (99,162)	30.6 (24.3,37.1)	-28.2 (-36.2,-17.7)
Latvia	539 (406,684)	39 (30.1,47.8)	195 (151,245)	32.8 (26.6,39.7)	-15.9 (-26.8,-5.3)
Lithuania	1022 (792,1305)	47.2 (37,59)	392 (306,481)	42.6 (34.5,51.6)	-9.9 (-21.9,4.4)
Republic of Moldova	1692 (1297,2143)	51.9 (41.1,63.4)	553 (425,689)	47 (37.2,56.5)	-9.5 (-22.4,4.4)
Russian Federation	49812 (39427,61848)	55.3 (44.1,66.6)	28678 (22841,35182)	49.1 (39.6,57.7)	-11.2 (-15.4,-6.5)
Ukraine	11827 (9139,15057)	41.3 (32.8,51.4)	6286 (4887,7995)	45 (36.5,54.9)	9 (-6.8,24.8)
Eastern Sub-Saharan Africa	132853 (99934,168819)	52.3 (40.6,63.7)	194241 (152150,242440)	43.2 (35.1,52.5)	-17.4 (-25,-8)
Burundi	4301 (3162,5554)	56.7 (43.7,70.4)	6513 (5031,8222)	43.5 (34.7,53.2)	-23.3 (-34,-11.4)
Comoros	297 (223,384)	51.2 (39.9,63.6)	261 (198,335)	45 (35.5,55.5)	-12.2 (-24.1,1)

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Djibouti	223 (166,282)	48 (38,58.8)	491 (380,605)	47.4 (38.3,56.8)	-1.3 (-14.3,13.1)
Eritrea	1936 (1459,2440)	45.5 (35.3,55.3)	2557 (1983,3171)	40.8 (32.9,49.2)	-10.3 (-22,3.7)
Ethiopia	35635 (26648,45600)	51.7 (39.8,63.6)	40762 (32042,50487)	36.8 (29.8,44.5)	-28.9 (-37.1,-18.6)
Kenya	12491 (9456,15620)	42.9 (33.4,52)	15622 (12085,19647)	36.4 (28.8,44.2)	-15.1 (-21.8,-7.9)
Madagascar	7828 (5809,9943)	51.9 (40.8,64.3)	10934 (8340,14202)	38.7 (30.6,48)	-25.4 (-35.7,-12.3)
Malawi	7759 (5777,10017)	58 (44.2,72.6)	8955 (7077,11156)	45.4 (36.9,55.3)	-21.6 (-34.9,-6.5)
Mozambique	8931 (6681,11358)	52.2 (39.8,65)	15961 (12424,20681)	44.4 (35.7,55.8)	-15 (-27.4,-0.6)
Rwanda	5114 (3833,6474)	53.8 (41.8,66.9)	6069 (4636,7616)	48.3 (38.6,58.8)	-10.2 (-22.8,5.1)
Somalia	5043 (3786,6365)	47.4 (36.7,58.8)	10775 (8153,13591)	39.3 (31.4,47.8)	-17.1 (-27.6,-6.1)
South Sudan	4024 (2978,5211)	55.2 (42.6,68.1)	5577 (4182,7189)	50 (39.2,62.7)	-9.4 (-21,1.6)
Uganda	12418 (9253,15979)	51.1 (39.7,62.7)	24746 (19051,31086)	48.3 (39.2,58.5)	-5.6 (-16.2,9)
United Republic of Tanzania	20630 (15211,26467)	59.7 (46.3,74.1)	34702 (26893,44136)	54.2 (43.2,66.8)	-9.3 (-21.4,7)
Zambia	6128 (4601,7695)	57.2 (44,70.6)	10146 (7863,12910)	49.1 (39.3,60.2)	-14.1 (-25.8,0.5)
High-income Asia Pacific	43454 (34478,53685)	50.3 (40.9,60.6)	24057 (19019,29118)	48.6 (39.2,57.4)	-3.5 (-8.8,2.6)
Brunei Darussalam	81 (62,105)	35.1 (28,43.8)	102 (78,125)	46.5 (37.8,55.5)	32.5 (15.5,52.8)
Japan	31249 (24822,38373)	54.7 (44.3,65.4)	17263 (13664,21113)	49.2 (39.8,58.1)	-10 (-13.9,-4.7)
Republic of Korea	11265 (8754,14527)	41.8 (33.5,52.4)	5795 (4456,7137)	46.6 (36.8,56.6)	11.3 (-3.5,28.9)
Singapore	858 (676,1084)	50.4 (39.9,62.4)	898 (689,1114)	47.5 (37.8,57.2)	-5.8 (-19.7,6.8)
High-income North America	71282 (56294,88403)	50.3 (40.1,59.6)	68601 (55330,83421)	47 (39.5,54.4)	-6.4 (-13.9,1.9)
Canada	3829 (3069,4841)	26.2 (21.4,32.3)	4924 (3829,6097)	32.5 (26.2,39.5)	24.1 (8.4,44.9)
Greenland	14 (11,18)	36.1 (28.4,44.4)	10 (8,12)	33.7 (27.1,41.1)	-6.5 (-17.4,6.6)
United States of America	67437 (53068,83564)	52.8 (42.1,62.5)	63666 (51323,77401)	48.6 (40.9,56.2)	-7.9 (-15.2,0.5)

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North Africa and Middle East	208416 (160683,254990)	56.5 (44.3,68.2)	212134 (167125,262386)	50.6 (40.9,59.5)	-10.6 (-18.9,-2)
Afghanistan	6495 (4844,8358)	53.8 (42,66.2)	16724 (13091,21022)	45.3 (36.9,55.5)	-15.9 (-27.3,-1.5)
Algeria	15028 (11551,18825)	53.5 (42.7,65)	16851 (13074,21109)	52 (41.6,63.5)	-2.8 (-15,13)
Bahrain	243 (187,304)	56.6 (45.1,68.8)	293 (225,377)	45.5 (36.8,56)	-19.6 (-32.5,-6.2)
Egypt	24564 (18724,31061)	44.1 (34.5,53.8)	36296 (27413,45685)	44.5 (34.9,53.4)	0.9 (-11.7,14.3)
Islamic Republic of Iran	43903 (33667,54037)	64.9 (51.3,78.1)	24040 (19048,29755)	51.8 (41.8,61.7)	-20.1 (-28.4,-9.9)
Iraq	12022 (9215,15303)	54.2 (42.8,66.6)	13426 (10137,17163)	44.6 (35.4,54.2)	-17.8 (-28.5,-6.8)
Jordan	2580 (1987,3246)	58.3 (45.3,71.9)	5404 (4083,6963)	63.1 (50.3,78.2)	8.2 (-8.3,26.5)
Kuwait	1117 (873,1390)	76 (61.1,91.7)	1550 (1193,1963)	78 (62.3,94.9)	2.6 (-10.7,18.3)
Lebanon	1567 (1188,2025)	56.2 (43.9,69.3)	1525 (1156,1915)	51.9 (41.5,62.6)	-7.6 (-21.7,7.1)
Libya	2486 (1949,3098)	54.3 (43.4,66.5)	1540 (1205,1889)	49.9 (40.4,60)	-8.1 (-19,4.3)
Morocco	10176 (7640,13025)	41.9 (32.1,52)	8601 (6558,10593)	39.8 (31.7,48.2)	-4.9 (-17.8,10)
Oman	1010 (769,1249)	45.7 (36.2,55.7)	1459 (1118,1830)	51.1 (41.1,61.8)	12 (-4.1,28.2)
Palestine	1445 (1088,1821)	52.9 (41.8,65.3)	1800 (1393,2269)	42.3 (33.6,51.6)	-20.1 (-31.7,-8.3)
Qatar	154 (116,191)	48.1 (37.7,58.3)	507 (385,630)	47.4 (37.8,57.3)	-1.5 (-15.4,16.9)
Saudi Arabia	8229 (6284,10302)	48.1 (37.9,58.3)	7441 (5734,9388)	48.6 (38.8,58.8)	1.1 (-9.7,14.3)
Sudan	13146 (9849,16560)	53 (40.7,64.4)	20929 (16241,26483)	51.6 (41.8,62.9)	-2.8 (-17.3,12.9)
Syrian Arab Republic	8295 (6055,10637)	53 (40.7,65.2)	3419 (2619,4333)	44.3 (34.9,54)	-16.5 (-29.8,-2.3)
Tunisia	4705 (3539,5905)	57.6 (45.3,70.8)	2968 (2299,3769)	47.6 (38.3,58.2)	-17.3 (-29.3,-2.3)
Turkey	41667 (31768,53173)	79.1 (62.7,98.1)	32266 (25574,41180)	76.4 (61.9,92.7)	-3.4 (-19,14)
United Arab Emirates	823 (622,1023)	48.8 (38.1,58.9)	1184 (906,1513)	39.2 (31,47.9)	-19.8 (-30.4,-5.7)
Yemen	8647 (6569,11060)	45.2 (35.5,55.7)	13715 (10586,17383)	41.5 (33.5,50.2)	-8.4 (-20.7,3.9)

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Oceania	2522 (1936,3119)	38.7 (30.7,47.1)	5296 (4082,6753)	41.6 (33.2,51.1)	7.5 (-1.7,19.5)
American Samoa	15 (11,18)	35.8 (28.7,43.7)	10 (7,12)	36 (28.9,43.5)	0.4 (-11.5,13.4)
Cook Islands	6 (4,7)	39.5 (30.6,49.1)	3 (2,4)	39 (31.2,47.3)	-1.2 (-11.7,12)
Federated States of Micronesia	41 (32,52)	40 (32.1,48.9)	23 (17,29)	36.3 (29.5,44.5)	-9.3 (-21.1,5.6)
Fiji	233 (178,297)	37.2 (29.4,46)	273 (211,349)	44.3 (35.5,54.5)	18.9 (2.3,37.5)
Guam	32 (24,41)	35 (27.5,42.7)	36 (28,45)	44.8 (35.5,53.8)	28.2 (11.5,45)
Kiribati	31 (24,40)	42.6 (33.2,52.7)	40 (30,50)	42.5 (33.5,51.8)	-0.2 (-11.5,14)
Marshall Islands	16 (12,21)	32.9 (26.2,40.2)	13 (10,17)	35.6 (28.7,42.8)	8.1 (-5.8,23.1)
Republic of Nauru	4 (3,5)	39.1 (31.3,47.3)	4 (3,5)	44.1 (35.5,53.7)	12.8 (-0.7,27.5)
Republic of Niue	1 (1,1)	39.2 (31.1,48.5)	0 (0,1)	48.4 (38.9,58.6)	23.3 (8.1,40.4)
Northern Mariana Islands	10 (8,13)	38.4 (30.6,47.2)	10 (7,12)	42.4 (33.6,51.6)	10.5 (-2.9,24.8)
Republic of Palau	4 (3,5)	39.8 (31.6,48.2)	3 (2,3)	41 (32.9,49)	3 (-8.6,15.8)
Papua New Guinea	1682 (1280,2103)	39.3 (31.5,48.5)	4239 (3205,5477)	41.8 (33.1,51.8)	6.4 (-4.6,22)
Samoa	68 (52,85)	41.9 (32.8,51.5)	64 (48,81)	36.6 (29.1,44.6)	-12.7 (-25.2,0.3)
Solomon Islands	127 (95,164)	35.3 (27.8,42.9)	214 (165,270)	37.5 (30.2,45.7)	6.2 (-9.1,20.1)
Tokelau	0 (0,1)	34.3 (27.4,42.6)	0 (0,0)	35.5 (28.3,43.1)	3.4 (-9.7,15.6)
Tonga	34 (26,42)	36.7 (29.4,44.6)	34 (26,42)	39.4 (31.8,47.5)	7.5 (-4.3,20.2)
Tuvalu	4 (3,5)	42.4 (33.2,52.4)	3 (2,4)	36.3 (29,43.9)	-14.3 (-26.5,1)
Vanuatu	52 (40,67)	33.1 (26.6,40.7)	91 (70,114)	34.9 (27.9,41.7)	5.4 (-6.6,22.2)
South Asia	506338 (380124,644021)	44.6 (34.7,54.6)	470433 (364266,595313)	39.5 (31.3,48.8)	-11.4 (-20.1,-1.8)
Bangladesh	64517 (47937,83957)	48.1 (37.3,59.6)	42134 (32001,55859)	40 (31.8,50.5)	-16.9 (-28.8,-2.9)
Bhutan	338 (253,428)	48.7 (37.5,60.1)	207 (157,261)	46.6 (36.6,57.4)	-4.3 (-17.3,11.1)

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India	381100 (286564,483734)	44.8 (34.9,54.9)	339527 (261225,429491)	39.7 (31.4,48.7)	-11.3 (-19.8,-1.3)
Nepal	10204 (7637,13205)	45.2 (35.1,55.2)	8621 (6591,11170)	40.1 (31.6,50)	-11.3 (-26.2,3.4)
Pakistan	50179 (37357,63935)	39.9 (31.4,49)	79943 (61268,101421)	38.8 (30.8,48.1)	-2.8 (-14.5,8.3)
Southeast Asia	185939 (142078,233199)	41.5 (32.6,50.1)	169267 (133052,209263)	40.5 (32.9,48.3)	-2.5 (-11.3,7.3)
Cambodia	5714 (4265,7489)	43.7 (33.7,54.8)	5271 (4108,6688)	42.1 (33.8,51.2)	-3.6 (-17.8,14.1)
Indonesia	67916 (51835,85938)	37.4 (29.3,45.6)	55858 (43398,69694)	34.3 (27.4,41.1)	-8.4 (-18,2.1)
Lao People's Democratic Republic	2501 (1909,3202)	48.4 (37.9,60.7)	2476 (1920,3197)	42.4 (33.8,53.3)	-12.3 (-26.5,2.4)
Malaysia	6215 (4791,7771)	37.2 (29.4,45.4)	7372 (5635,9292)	41.7 (32.9,51.4)	12.1 (-3.4,29.1)
Maldives	152 (117,192)	50.4 (39.4,62.5)	106 (82,133)	44.1 (34.3,52.7)	-12.6 (-23.2,1.6)
Mauritius	358 (280,446)	43.4 (34.9,52.7)	264 (211,331)	53.1 (43.1,64.4)	22.1 (7.2,39)
Myanmar	16939 (12560,21997)	44.1 (34.3,54.8)	18271 (14162,22945)	46.6 (37.5,56.2)	5.7 (-9.7,22.5)
Philippines	34359 (26287,42932)	52.3 (41.1,62.9)	40781 (32356,49674)	48.8 (39.9,57.9)	-6.8 (-14.3,2)
Seychelles	22 (17,28)	38.8 (30.3,47.4)	33 (26,41)	55.9 (45.5,68)	44.2 (25.7,65.9)
Sri Lanka	5745 (4324,7280)	41.6 (32.7,51)	4948 (3758,6282)	41.6 (32.5,50.7)	-0.1 (-13.5,15.2)
Thailand	17606 (13346,22233)	42.3 (32.7,51.5)	6776 (5137,8578)	33 (26.1,40.3)	-22 (-35.3,-5.5)
Timor-Leste	404 (301,515)	42.5 (33,52.2)	466 (357,588)	36.8 (29,44.2)	-13.4 (-26.2,2.7)
Socialist Republic of Viet Nam	27737 (21478,34931)	40 (32.1,48.4)	26408 (20613,33178)	43.8 (35.2,53.4)	9.6 (-5.1,23.8)
Southern Latin America	15239 (12213,19074)	38.1 (31.1,46.5)	18270 (14277,22311)	52.5 (42.7,62.1)	38 (22.3,56.3)
Uruguay	877 (672,1095)	40.6 (32,49.6)	823 (646,1038)	53.3 (42.6,65.2)	31.1 (16.7,49.2)
Argentina	9253 (7445,11625)	34.1 (28,41.5)	11742 (9009,14546)	47.3 (37.7,56.8)	38.4 (16.4,62.6)
Chile	5109 (3998,6445)	47.1 (38,58.3)	5704 (4450,6940)	66.3 (53.8,78.1)	40.9 (23,62.6)
Southern Sub-Saharan Africa	20289 (15754,25730)	40.7 (32.6,49.5)	23168 (18293,28690)	41.7 (33.9,49.9)	2.5 (-4.3,11.6)

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Botswana	603 (465,761)	47.2 (37.8,57.9)	821 (632,1034)	55.2 (43.4,66.6)	16.9 (1.6,34.5)
Lesotho	654 (501,839)	41.5 (32.4,50.8)	577 (437,735)	42.8 (34.1,52.3)	3 (-11.5,18)
Namibia	559 (434,710)	40 (32,48.9)	777 (598,979)	42.4 (33.9,51.6)	6.2 (-6.4,20.2)
South Africa	13188 (10188,16765)	39.9 (31.8,48.4)	14939 (11773,18376)	42 (34.1,49.9)	5.4 (-2.4,16)
Kingdom of Eswatini	434 (332,541)	47.6 (37.8,58.3)	431 (333,549)	47 (37.4,57.4)	-1.2 (-14.9,15)
Zimbabwe	4851 (3661,6234)	42.7 (34.1,52.5)	5623 (4378,7240)	40 (32.3,48.4)	-6.4 (-16.6,5.3)
Tropical Latin America	128208 (98858,157914)	93.7 (75,112.9)	107376 (86108,132636)	86.5 (70.6,103.4)	-7.7 (-16.5,2.2)
Brazil	125366 (96699,154412)	94.6 (75.9,114.1)	103458 (82937,127949)	86.7 (70.7,103.5)	-8.3 (-17.3,2)
Paraguay	2842 (2148,3501)	68.3 (54.3,83.2)	3918 (3017,4942)	81.3 (65.1,99.5)	19.1 (3.8,36)
Western Europe	93081 (76409,111656)	56.1 (46.6,65.7)	78193 (63870,94889)	51.5 (42.8,61.2)	-8.2 (-13.2,-3.7)
Andorra	14 (10,17)	64.2 (51.1,77.7)	9 (7,12)	47.7 (38.3,57.5)	-25.7 (-35,-14.8)
Austria	2286 (1871,2795)	71.3 (58.8,84.2)	1659 (1314,2082)	59.6 (48.7,71)	-16.5 (-25.2,-6.2)
Belgium	2385 (1941,2909)	56 (46.9,66.8)	2043 (1645,2551)	49.6 (41,59.6)	-11.4 (-22.3,0)
Cyprus	279 (213,350)	60 (47.8,72.7)	204 (159,255)	45.7 (36.6,55)	-23.9 (-34.1,-11.6)
Denmark	1241 (1001,1503)	58.2 (47.6,69.2)	1131 (900,1410)	51.7 (42,61.7)	-11.1 (-21.5,0.3)
Finland	1522 (1208,1865)	66.9 (55.1,80.5)	904 (689,1162)	52.7 (42,64.4)	-21.2 (-31.2,-10.3)
France	13205 (11074,15693)	48.2 (40.8,56.7)	12539 (10441,15081)	48.5 (40.6,57.9)	0.7 (-10.5,12.2)
Germany	16325 (13156,19583)	53 (44,63)	13725 (10986,17009)	50.6 (41.5,62)	-4.4 (-17.5,9.2)
Greece	2556 (2008,3221)	57.4 (46.6,70.1)	1696 (1329,2134)	55.2 (45.2,67.9)	-3.8 (-14.7,9.2)
Iceland	116 (90,150)	76.6 (60.5,93.8)	103 (80,127)	71.9 (57.8,87.1)	-6.1 (-17.2,7.4)
Ireland	1227 (1017,1473)	55.2 (46.5,65.3)	922 (740,1140)	44.4 (36,53.4)	-19.5 (-29.6,-9.2)
Israel	1554 (1212,1963)	43.1 (34.9,52.4)	2474 (1926,3093)	42 (33,50.8)	-2.7 (-14.5,11.9)

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Italy	11848 (9463,14379)	58.9 (48,69.1)	9774 (7787,12124)	56.4 (46.4,67.6)	-4.2 (-11.7,2.6)
Luxembourg	78 (60,98)	50.5 (40.5,61.3)	84 (66,104)	41.1 (33.3,50)	-18.6 (-27.7,-7.2)
Malta	138 (111,176)	66.9 (55.3,82.9)	108 (85,139)	70 (56.1,85.3)	4.6 (-7.7,17.6)
Principality of Monaco	4 (3,5)	48.9 (39,59.6)	4 (3,5)	40.7 (32.9,49.6)	-16.8 (-26.2,-7.3)
Netherlands	4242 (3430,5161)	65.2 (54.6,78.3)	3503 (2775,4503)	59.1 (48.5,72.2)	-9.4 (-20.7,4.5)
Norway	1373 (1090,1680)	64 (51.7,76.3)	809 (626,999)	38.4 (31,45.8)	-40 (-44.2,-35.9)
Portugal	2276 (1802,2857)	47.7 (38.9,58.2)	1268 (993,1567)	43.7 (35.4,51.8)	-8.5 (-19.8,5.4)
Republic of San Marino	5 (4,7)	58.6 (46.7,71.3)	5 (4,6)	51.8 (41.1,63)	-11.5 (-21.2,-0.9)
Spain	7155 (6011,8693)	42.2 (35.8,50)	5781 (4734,6906)	41.4 (34.8,48.8)	-1.9 (-14.6,11.5)
Sweden	3052 (2413,3818)	74.8 (60,92.2)	2304 (1805,2846)	55.7 (44.5,66.6)	-25.5 (-33.5,-16.7)
Switzerland	2037 (1632,2506)	72.2 (60.4,86.9)	1722 (1355,2167)	58.6 (47.7,71.9)	-18.9 (-31,-4.8)
United Kingdom	18085 (13967,22338)	66.9 (53.5,80.1)	15352 (12057,18915)	58.6 (46.8,68.9)	-12.5 (-19.9,-4.7)
Western Sub-Saharan Africa	124600 (94094,158114)	50.5 (39.3,61.6)	269658 (207960,334316)	48.2 (38.9,57.8)	-4.6 (-11.8,3.7)
Benin	3744 (2815,4687)	54.5 (42.9,65.9)	8761 (6710,11069)	53.6 (42.8,64.8)	-1.6 (-13.7,10.6)
Burkina Faso	7075 (5259,9076)	52.7 (40.5,64.7)	16689 (12704,21017)	56.9 (44.5,68.9)	8.1 (-3.7,22.2)
Cameroon	7084 (5251,9027)	52.7 (40.2,64.8)	18129 (14111,23281)	53 (42.9,64.4)	0.5 (-13.3,15.9)
Chad	3937 (2891,5147)	47.1 (36.1,59.1)	10423 (7841,13351)	43.3 (34.5,52.7)	-8 (-18.5,4.6)
Ghana	8184 (6130,10189)	46 (36,55.7)	16426 (12435,20793)	50.7 (40.4,61.1)	10.1 (-3.1,25.3)
Guinea	4277 (3203,5505)	53.4 (41.5,66.2)	7685 (5813,9635)	48.5 (38.3,58.9)	-9.2 (-20.8,4)
Guinea-Bissau	690 (520,889)	52 (40.4,64.2)	908 (693,1162)	40.6 (32.5,49.7)	-21.9 (-34.7,-8.2)
Liberia	1968 (1468,2513)	60 (46.6,75.5)	2300 (1760,2914)	44 (34.9,53.4)	-26.7 (-37.5,-13.7)
Mali	6178 (4601,8036)	52.1 (40,64.6)	15909 (11773,20251)	51.3 (40.1,62.9)	-1.4 (-14.2,14.1)

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Mauritania	1165 (874,1470)	47.6 (36.5,57.8)	1865 (1428,2403)	42.4 (33.3,51.7)	-11 (-23.4,2.8)
Niger	5643 (4164,7279)	50 (37.8,61.5)	15022 (11312,19148)	44.4 (35,54.4)	-11.2 (-22.5,0.9)
Nigeria	54781 (41648,69871)	49.7 (38.9,60.7)	124412 (96137,154792)	47 (37.9,56.9)	-5.4 (-12.6,2.9)
Sao Tome and Principe	86 (65,112)	56.6 (43.6,70.1)	90 (71,114)	48.8 (39,59.3)	-13.8 (-26.8,3.7)
Senegal	5223 (3872,6618)	51.6 (40.2,63.2)	6955 (5447,8707)	44 (35.1,52.8)	-14.8 (-25.4,-1.3)
Sierra Leone	3233 (2387,4157)	59 (44.7,73.2)	5356 (3945,6792)	54.8 (42.8,67.8)	-7.1 (-19.8,7.3)
Togo	2312 (1760,2990)	48.8 (37.9,61.3)	3320 (2529,4195)	41.8 (33.7,50.5)	-14.4 (-27.4,-1.3)
Republic of Coate d'Ivoire	8210 (6034,10689)	51.4 (39.5,63.3)	14282 (11041,17783)	48.3 (38.9,58.4)	-6.1 (-19.2,10.1)
Republic of Cabo Verde	215 (159,271)	50.5 (38.9,62.6)	153 (116,195)	46.5 (36.6,57.3)	-7.9 (-19.9,5.4)
Republic of the Gambia	589 (440,749)	46.7 (36.9,57.3)	968 (752,1218)	40.5 (32.7,48.9)	-13.3 (-25.2,-0.3)

95% UI=95% uncertainty intervals.

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Table S2: Deaths due to digestive congenital anomalies in 1990-2021 among aged 0-14 years and the percentage change in the age-standardized rates (ASRs) per 100,000, by location (Generated from data available from https://vizhub.healthdata.org/gbd-results/)

	1990		2021		Percentage change in the ASRs per 100 000
	No(95%UI)	ASRs per 100 000 (95%UI)	No(95%UI)	ASRs per 100 000 (95%UI)	
Global	74386 (41045,115974)	1.2 (0.7,1.9)	47156 (35183,59027)	0.8 (0.6,1)	-35.3 (-57.5,16.7)
Andean Latin America	1061 (549,1715)	1.9 (1,3.1)	586 (411,782)	1 (0.7,1.3)	-48 (-71.7,7.3)
Plurinational State of Bolivia	346 (126,674)	3.3 (1.2,6.4)	210 (134,294)	1.8 (1.2,2.6)	-44.2 (-70.3,43.5)
Ecuador	124 (100,163)	0.9 (0.7,1.2)	161 (116,217)	1.1 (0.8,1.4)	19.1 (-21.3,73)
Peru	591 (283,993)	2 (0.9,3.3)	215 (123,326)	0.7 (0.4,1)	-65.1 (-84.4,-13.7)
Australasia	76 (67,94)	0.5 (0.5,0.6)	24 (19,37)	0.1 (0.1,0.2)	-71.5 (-78.4,-59.2)
Australia	62 (53,79)	0.5 (0.4,0.7)	19 (14,31)	0.1 (0.1,0.2)	-72.6 (-80.1,-59.8)
New Zealand	14 (11,16)	0.5 (0.4,0.6)	5 (4,7)	0.2 (0.1,0.2)	-65.6 (-74.8,-52.5)
Caribbean	781 (446,1288)	1.9 (1.1,3.1)	478 (280,769)	1.3 (0.7,2)	-31.6 (-54.1,11.3)
Antigua and Barbuda	0 (0,0)	0.3 (0.2,0.5)	0 (0,0)	0.3 (0.2,0.4)	-16.2 (-37.2,11.6)
Barbados	2 (1,2)	0.8 (0.6,1)	1 (1,1)	0.7 (0.5,1)	-13.7 (-42.9,24.5)
Belize	3 (3,4)	1.2 (0.8,1.5)	3 (2,4)	0.8 (0.6,1)	-34.5 (-52.6,-7.7)
Bermuda	0 (0,0)	0.5 (0.3,0.7)	0 (0,0)	0.2 (0.1,0.4)	-45.3 (-68.2,-11.6)
Commonwealth of the Bahamas	1 (1,1)	0.4 (0.3,0.5)	1 (0,1)	0.3 (0.2,0.4)	-27.5 (-49.8,10)
Cuba	141 (97,172)	1.7 (1.2,2.1)	25 (20,32)	0.5 (0.4,0.7)	-68.5 (-77.1,-53.3)
Dominica	0 (0,1)	0.5 (0.3,0.8)	0 (0,0)	1 (0.6,1.6)	101 (24,215.7)
Dominican Republic	203 (106,315)	1.9 (1,3)	96 (51,186)	0.9 (0.5,1.8)	-50.7 (-77.4,-2.4)
Grenada	0 (0,1)	0.4 (0.3,0.7)	0 (0,0)	0.3 (0.2,0.5)	-19.9 (-42.9,18.7)
Guyana	15 (10,19)	1.2 (0.9,1.5)	6 (4,9)	0.8 (0.6,1.2)	-31.1

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					(-56.3,2.8)
Haiti	312 (104,736)	2.7 (0.9,6.4)	299 (126,564)	1.9 (0.8,3.5)	-31.4 (-58.7,41)
Jamaica	29 (21,39)	1.1 (0.8,1.4)	12 (9,17)	0.8 (0.5,1.1)	-28 (-53.5,8.9)
Puerto Rico	20 (16,24)	0.6 (0.5,0.8)	4 (3,5)	0.5 (0.3,0.6)	-28.4 (-49.8,-4.6)
Saint Kitts and Nevis	0 (0,0)	0.8 (0.6,1)	0 (0,0)	0.6 (0.4,0.8)	-24.8 (-46,7.6)
Saint Lucia	1 (1,2)	0.7 (0.5,1)	0 (0,1)	0.5 (0.3,0.8)	-26.1 (-54.6,19)
Saint Vincent and the Grenadines	1 (1,2)	1.1 (0.8,1.5)	0 (0,1)	0.7 (0.5,0.9)	-41.8 (-60.8,-10.3)
Suriname	10 (5,15)	2.4 (1.3,3.4)	7 (4,10)	1.7 (1.1,2.5)	-29.3 (-58.5,18)
Trinidad and Tobago	13 (10,17)	1.2 (0.9,1.5)	7 (5,9)	0.9 (0.6,1.2)	-21.8 (-48.2,15.7)
United States Virgin Islands	1 (0,1)	0.5 (0.3,0.9)	0 (0,0)	0.2 (0.1,0.5)	-65.6 (-86.2,-28.3)
Central Asia	731 (567,923)	0.8 (0.6,1)	601 (475,770)	0.6 (0.5,0.8)	-21.4 (-40,6.2)
Armenia	75 (43,105)	2.1 (1.2,2.9)	19 (13,25)	1.1 (0.8,1.5)	-45.4 (-63.2,-10)
Azerbaijan	71 (37,122)	0.8 (0.4,1.4)	33 (19,56)	0.5 (0.3,0.9)	-36.2 (-67.6,25.3)
Georgia	22 (13,32)	0.5 (0.3,0.8)	10 (7,14)	0.5 (0.3,0.7)	-9.6 (-46.4,67.2)
Kazakhstan	167 (115,215)	1 (0.7,1.2)	125 (90,176)	0.7 (0.5,0.9)	-31.9 (-55.5,-2)
Kyrgyzstan	84 (53,109)	1.3 (0.8,1.7)	74 (59,92)	1 (0.8,1.2)	-25.8 (-49.4,14.9)
Mongolia	84 (40,159)	2.5 (1.2,4.7)	35 (22,49)	1 (0.6,1.3)	-61.4 (-81.3,-13.9)
Tajikistan	54 (30,86)	0.6 (0.3,0.9)	71 (35,132)	0.5 (0.3,1)	-4.2 (-53.1,123.2)
Turkmenistan	63 (41,85)	1.1 (0.7,1.4)	79 (47,117)	1.5 (0.9,2.2)	40.8 (-5.3,104.4)
Uzbekistan	111 (76,202)	0.3 (0.2,0.6)	156 (96,259)	0.4 (0.3,0.7)	23.4 (-25.6,104.4)
Central Europe	896 (671,1162)	1.1 (0.8,1.4)	140 (109,175)	0.3 (0.2,0.4)	-74.1 (-83.2,-61.5)
Albania	16 (9,25)	0.4 (0.2,0.6)	4 (2,7)	0.3 (0.1,0.5)	-35 (-68.1,23.1)
Bosnia and Herzegovina	12 (6,19)	0.4 (0.2,0.6)	2 (1,5)	0.2 (0.1,0.4)	-51.7 (-72.5,-8.7)
Bulgaria	56 (45,74)	1.1 (0.9,1.5)	9 (7,12)	0.3 (0.3,0.4)	-70.6 (-82.5,-57.3)
Croatia	22 (18,26)	0.8 (0.7,1)	5 (3,6)	0.3 (0.2,0.4)	-66.5 (-77.5,-53.1)
Czech Republic	48 (36,59)	0.8 (0.6,0.9)	5 (3,7)	0.1 (0.1,0.1)	-87.2 (-91.9,-78.8)

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Hungary	62 (48,72)	1 (0.8,1.2)	7 (5,11)	0.2 (0.1,0.3)	-82.5 (-88.9,-70.4)
Montenegro	2 (1,4)	0.5 (0.3,0.8)	0 (0,1)	0.1 (0,0.2)	-82.6 (-93.4,-58.4)
North Macedonia	25 (11,46)	1.5 (0.7,2.8)	2 (1,4)	0.3 (0.2,0.4)	-82 (-92.1,-50.6)
Poland	251 (195,310)	0.9 (0.7,1.2)	40 (28,55)	0.2 (0.2,0.3)	-74.4 (-84.6,-62.7)
Romania	292 (178,411)	1.9 (1.2,2.7)	47 (36,58)	0.6 (0.4,0.7)	-71.5 (-79.7,-57)
Serbia	67 (33,109)	1 (0.5,1.7)	7 (4,14)	0.2 (0.1,0.4)	-78.7 (-91.4,-31.1)
Slovakia	23 (17,33)	0.6 (0.4,0.9)	8 (5,12)	0.3 (0.2,0.5)	-53.8 (-74.3,-22.5)
Slovenia	6 (5,7)	0.6 (0.4,0.7)	1 (1,1)	0.1 (0.1,0.1)	-85 (-90,-72.6)
Central Latin America	2617 (2250,3255)	1.1 (1,1.4)	1890 (1401,2462)	1 (0.8,1.3)	-8.6 (-39.1,27.1)
Colombia	449 (374,552)	1 (0.9,1.3)	268 (182,389)	0.8 (0.6,1.2)	-19.4 (-46.1,20)
Costa Rica	42 (35,51)	1.1 (0.9,1.3)	21 (16,26)	0.8 (0.6,1)	-26 (-42.3,-5.1)
El Salvador	56 (27,89)	0.7 (0.3,1.1)	16 (7,35)	0.3 (0.1,0.6)	-57.8 (-84.6,10.2)
Guatemala	76 (57,114)	0.5 (0.4,0.7)	140 (101,205)	1 (0.7,1.4)	103.8 (41.2,184.2)
Honduras	125 (75,187)	1.5 (0.9,2.2)	79 (48,121)	0.8 (0.5,1.2)	-48.2 (-73.5,-2.2)
Mexico	1395 (1197,1753)	1.2 (1,1.5)	914 (656,1200)	1 (0.7,1.3)	-12.9 (-41.8,22.1)
Nicaragua	167 (87,278)	2.5 (1.3,4.1)	72 (45,110)	1.2 (0.7,1.8)	-52.3 (-77.6,9)
Panama	39 (32,49)	1.4 (1.1,1.7)	39 (28,51)	1.2 (0.8,1.5)	-18.1 (-43.9,16.1)
Bolivarian Republic of Venezuela	266 (216,321)	1 (0.8,1.2)	341 (239,467)	1.6 (1.1,2.2)	55.8 (7.8,112.2)
Central Sub-Saharan Africa	1828 (441,3562)	1.6 (0.4,3.1)	1621 (864,2825)	0.8 (0.4,1.4)	-50.4 (-71.5,25.5)
Angola	355 (66,769)	1.6 (0.3,3.5)	491 (244,772)	0.9 (0.5,1.4)	-45.3 (-70.4,75.9)
Central African Republic	101 (21,221)	1.8 (0.4,3.9)	108 (38,190)	1.2 (0.5,2.2)	-30.8 (-55.3,43.6)
Congo	54 (18,97)	1.3 (0.5,2.3)	44 (26,77)	0.7 (0.5,1.3)	-42.4 (-67.2,41.8)
Democratic Republic of the Congo	1289 (317,2413)	1.6 (0.4,3)	949 (506,1733)	0.7 (0.4,1.3)	-54.9 (-77,20.9)
Equatorial Guinea	11 (3,23)	1.2 (0.3,2.5)	16 (8,26)	0.9 (0.5,1.5)	-28.1

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					(-63.4,129.3)
Gabon	18 (6,33)	1.1 (0.4,2)	14 (7,23)	0.7 (0.4,1.1)	-36.9 (-65.8,49.8)
East Asia	14305 (7586,26087)	1.3 (0.7,2.3)	2451 (1532,3638)	0.4 (0.3,0.6)	-65.7 (-84,-19.8)
China	13985 (7382,25636)	1.3 (0.7,2.3)	2374 (1485,3524)	0.4 (0.3,0.6)	-66 (-84.3,-19.5)
Democratic People's Republic of Korea	256 (142,408)	1 (0.6,1.6)	64 (34,107)	0.5 (0.2,0.8)	-54.9 (-79.9,0.4)
Taiwan (Province of China)	64 (50,73)	0.4 (0.3,0.5)	13 (10,17)	0.2 (0.1,0.2)	-57.8 (-68.9,-37.4)
Eastern Europe	1748 (1391,2061)	1.2 (1,1.4)	287 (211,384)	0.3 (0.3,0.4)	-72.1 (-81.1,-58.6)
Belarus	67 (49,86)	1 (0.7,1.3)	11 (7,17)	0.3 (0.2,0.4)	-70.3 (-82.5,-51.8)
Estonia	5 (4,7)	0.5 (0.4,0.6)	0 (0,1)	0.1 (0,0.1)	-87.8 (-93.7,-72.3)
Latvia	11 (8,14)	0.6 (0.4,0.8)	1 (0,1)	0.1 (0.1,0.2)	-85.2 (-92.8,-69.7)
Lithuania	25 (20,30)	0.9 (0.8,1.1)	2 (2,3)	0.2 (0.1,0.3)	-78.2 (-86.2,-66.6)
Republic of Moldova	80 (50,118)	2.1 (1.3,3.1)	13 (9,18)	0.9 (0.7,1.3)	-55.6 (-70.1,-27.1)
Russian Federation	1213 (974,1411)	1.3 (1,1.5)	212 (146,293)	0.3 (0.2,0.5)	-73.6 (-83,-60.9)
Ukraine	347 (259,441)	1.1 (0.8,1.4)	47 (32,69)	0.4 (0.2,0.5)	-66.9 (-79.2,-46.5)
Eastern Sub-Saharan Africa	6763 (1546,13941)	1.7 (0.4,3.5)	6516 (3509,10591)	1 (0.6,1.7)	-39.5 (-65.5,59.6)
Burundi	202 (37,426)	1.7 (0.3,3.6)	187 (88,313)	0.9 (0.4,1.4)	-50.1 (-74.8,42.3)
Comoros	15 (4,31)	1.7 (0.4,3.4)	9 (4,15)	1.1 (0.5,1.9)	-36.8 (-67.7,45.2)
Djibouti	8 (3,16)	1.2 (0.4,2.3)	10 (5,21)	0.7 (0.4,1.5)	-38.4 (-72.2,47.6)
Eritrea	78 (18,162)	1.2 (0.3,2.4)	79 (39,159)	0.9 (0.5,1.8)	-25.1 (-66.1,109.3)
Ethiopia	1794 (373,3956)	1.7 (0.4,3.7)	1397 (741,2437)	0.9 (0.5,1.5)	-48.4 (-74.4,48.6)
Kenya	460 (175,874)	1 (0.4,1.9)	372 (217,729)	0.7 (0.4,1.3)	-34 (-69.1,50.5)
Madagascar	351 (89,728)	1.5 (0.4,3.1)	374 (172,641)	0.9 (0.5,1.6)	-36.8 (-64.9,48.5)
Malawi	474 (94,1000)	2.1 (0.4,4.6)	258 (151,425)	1 (0.6,1.6)	-54.7

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					(-81.1,75.1)
Mozambique	608 (115,1354)	2.3 (0.5,5)	620 (292,1104)	1.2 (0.6,2.1)	-46.3 (-72.5,63.2)
Rwanda	266 (45,556)	1.9 (0.3,3.9)	153 (77,264)	0.9 (0.5,1.5)	-52.3 (-77.3,64)
Somalia	221 (46,504)	1.3 (0.3,2.9)	384 (124,768)	0.9 (0.3,1.7)	-31.6 (-58.9,32)
South Sudan	199 (35,455)	1.7 (0.3,4)	305 (78,608)	1.8 (0.5,3.5)	1.1 (-31.4,95.1)
Uganda	551 (106,1157)	1.3 (0.3,2.8)	788 (359,1259)	1.1 (0.5,1.7)	-19.5 (-54.7,127.5)
United Republic of Tanzania	1183 (247,2527)	2.2 (0.5,4.7)	1241 (598,1931)	1.4 (0.7,2.2)	-36 (-64.4,83.8)
Zambia	348 (73,734)	2.1 (0.5,4.3)	331 (195,561)	1.2 (0.7,2)	-43 (-78.3,140.4)
High-income Asia Pacific	433 (337,553)	0.5 (0.4,0.6)	79 (59,108)	0.1 (0.1,0.2)	-68.5 (-79.5,-53.3)
Brunei Darussalam	1 (1,2)	0.4 (0.3,0.6)	1 (1,2)	0.4 (0.2,0.5)	-12.8 (-39.9,35.7)
Japan	264 (215,333)	0.4 (0.4,0.6)	60 (44,80)	0.2 (0.1,0.2)	-65.2 (-78.4,-52)
Republic of Korea	154 (88,235)	0.5 (0.3,0.7)	16 (9,31)	0.1 (0.1,0.2)	-74.7 (-87.4,-35.7)
Singapore	13 (10,17)	0.6 (0.5,0.7)	2 (2,4)	0.1 (0.1,0.2)	-82.7 (-89.1,-74.8)
High-income North America	702 (644,892)	0.3 (0.3,0.4)	411 (316,485)	0.2 (0.2,0.3)	-33.4 (-53.4,-20.9)
Canada	70 (61,90)	0.4 (0.3,0.5)	33 (24,43)	0.2 (0.1,0.3)	-47.3 (-64.8,-30.8)
Greenland	1 (0,1)	0.9 (0.5,1.6)	0 (0,0)	0.3 (0.2,0.6)	-63.1 (-82.5,-8.3)
United States of America	631 (580,796)	0.3 (0.3,0.4)	378 (291,447)	0.2 (0.2,0.3)	-31.8 (-52.3,-19.4)
North Africa and Middle East	10247 (3586,20166)	2 (0.7,3.9)	4198 (2874,5521)	0.7 (0.5,1)	-63 (-78.9,-10.8)
Afghanistan	518 (95,1282)	2.6 (0.5,6.5)	802 (384,1431)	1.4 (0.7,2.5)	-45.6 (-68.8,70.9)
Algeria	675 (281,1244)	1.8 (0.8,3.4)	332 (206,477)	0.8 (0.5,1.1)	-58.8 (-79.5,0.8)
Bahrain	4 (2,7)	0.7 (0.4,1.1)	2 (1,3)	0.2 (0.1,0.4)	-72.3 (-87.2,-45.2)
Egypt	1799 (440,3791)	2 (0.5,4.3)	721 (489,1043)	0.6 (0.4,0.8)	-71.3 (-87.2,18.7)
Islamic Republic of Iran	1446 (662,2496)	1.9 (0.9,3.3)	111 (61,171)	0.2 (0.1,0.3)	-88.3 (-95.6,-67.7)
Iraq	417 (128,807)	1.3 (0.4,2.5)	221 (143,358)	0.6 (0.4,0.9)	-56.6

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					(-81.1,32.7)
Jordan	92 (53,141)	1.5 (0.9,2.3)	72 (48,105)	0.7 (0.5,1)	-52.2 (-74.3,-3.2)
Kuwait	18 (13,23)	1.1 (0.8,1.4)	15 (11,20)	0.6 (0.5,0.8)	-43 (-61.4,-11)
Lebanon	51 (17,105)	1.3 (0.4,2.6)	15 (9,23)	0.4 (0.3,0.6)	-68.4 (-86.6,-12.3)
Libya	97 (50,163)	1.6 (0.8,2.6)	43 (22,75)	1.1 (0.6,1.9)	-28.8 (-55.1,14.1)
Morocco	265 (100,518)	0.7 (0.3,1.4)	76 (40,161)	0.2 (0.1,0.5)	-65.2 (-86.6,-7.1)
Oman	17 (7,32)	0.5 (0.2,0.9)	9 (4,23)	0.2 (0.1,0.6)	-53.1 (-83,15.5)
Palestine	38 (19,64)	0.9 (0.5,1.6)	20 (12,36)	0.3 (0.2,0.6)	-63 (-84.3,-16.9)
Qatar	2 (1,4)	0.3 (0.2,0.7)	2 (1,5)	0.1 (0,0.3)	-70.8 (-88.1,-38.9)
Saudi Arabia	212 (101,356)	0.9 (0.4,1.5)	29 (10,82)	0.1 (0.1,0.4)	-83.5 (-95.1,-52.8)
Sudan	1067 (162,3268)	2.7 (0.4,8.4)	693 (401,1115)	1.3 (0.7,2)	-53.2 (-81.4,104.2)
Syrian Arab Republic	306 (117,625)	1.4 (0.6,2.9)	44 (26,74)	0.5 (0.3,0.8)	-66.9 (-87.1,-2)
Tunisia	176 (67,337)	1.7 (0.6,3.2)	39 (25,59)	0.5 (0.3,0.7)	-70.9 (-87,-24.5)
Turkey	2370 (655,4601)	3.4 (0.9,6.6)	398 (280,561)	0.8 (0.6,1.1)	-75.8 (-90.2,-18.5)
United Arab Emirates	22 (12,38)	1 (0.5,1.7)	9 (4,16)	0.3 (0.1,0.4)	-73.2 (-89.4,-43.3)
Yemen	650 (138,1716)	2.2 (0.5,5.7)	541 (286,916)	1.2 (0.6,2)	-45.6 (-72.4,74.9)
Oceania	32 (11,72)	0.3 (0.1,0.7)	58 (21,143)	0.3 (0.1,0.7)	-4.7 (-43.8,55.3)
American Samoa	0 (0,0)	0.1 (0,0.3)	0 (0,0)	0.1 (0,0.4)	-20.4 (-68.5,61.2)
Cook Islands	0 (0,0)	0.1 (0.1,0.4)	0 (0,0)	0.1 (0,0.2)	-42.5 (-81.4,75.9)
Federated States of Micronesia	0 (0,1)	0.3 (0.1,0.5)	0 (0,0)	0.1 (0.1,0.4)	-47.7 (-77.4,46.3)
Fiji	2 (1,4)	0.3 (0.1,0.5)	3 (1,5)	0.4 (0.2,0.6)	30.9 (-24.9,145.2)
Guam	0 (0,1)	0.1 (0,0.4)	0 (0,1)	0.1 (0,0.4)	-19 (-65.9,49.8)
Kiribati	0 (0,1)	0.3 (0.1,0.7)	0 (0,1)	0.2 (0.1,0.6)	-36.4 (-66.2,28)
Marshall Islands	0 (0,0)	0.2 (0.1,0.4)	0 (0,0)	0.2 (0.1,0.5)	-12.5 (-51.2,53.6)
Republic of Nauru	0 (0,0)	0.2 (0.1,0.5)	0 (0,0)	0.2 (0.1,0.5)	-9.7

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					(-47.1,62.5)
Republic of Niue	0 (0,0)	0.2 (0.1,0.6)	0 (0,0)	0.6 (0.3,1.7)	182.5 (66.6,352.5)
Northern Mariana Islands	0 (0,0)	0.1 (0,0.3)	0 (0,0)	0 (0,0.1)	-86.1 (-96.9,-61.2)
Republic of Palau	0 (0,0)	0.3 (0.1,0.7)	0 (0,0)	0.2 (0.1,0.5)	-41.4 (-68.3,7.9)
Papua New Guinea	23 (6,59)	0.3 (0.1,0.9)	49 (16,122)	0.3 (0.1,0.8)	-10 (-52.3,61.9)
Samoa	0 (0,1)	0.2 (0.1,0.5)	0 (0,1)	0.1 (0.1,0.4)	-39.7 (-76.4,38.3)
Solomon Islands	1 (1,3)	0.2 (0.1,0.5)	1 (1,5)	0.2 (0.1,0.5)	-27.1 (-65.4,57.6)
Tokelau	0 (0,0)	0.2 (0.1,0.6)	0 (0,0)	0.6 (0.2,2.4)	226.3 (18.2,704.2)
Tonga	0 (0,1)	0.1 (0.1,0.4)	0 (0,1)	0.1 (0,0.4)	-29.3 (-68.7,44.5)
Tuvalu	0 (0,0)	0.4 (0.1,0.8)	0 (0,0)	0.2 (0.1,0.5)	-55.2 (-83.1,35.9)
Vanuatu	1 (0,1)	0.2 (0.1,0.5)	1 (0,2)	0.1 (0.1,0.4)	-22.3 (-55.9,43)
South Asia	15567 (6691,28626)	1 (0.4,1.8)	9515 (5318,15987)	0.6 (0.4,1.1)	-34.2 (-63.5,49.3)
Bangladesh	2322 (663,5330)	1.2 (0.3,2.7)	667 (266,1377)	0.5 (0.2,1.1)	-57.4 (-83.4,37.8)
Bhutan	10 (3,25)	1 (0.3,2.4)	3 (1,7)	0.6 (0.2,1.2)	-44.1 (-80.3,106.7)
India	11268 (5174,20116)	1 (0.5,1.7)	6842 (3851,11743)	0.7 (0.4,1.1)	-31.1 (-62.6,57.1)
Nepal	228 (74,448)	0.6 (0.2,1.2)	91 (41,219)	0.3 (0.1,0.7)	-52.2 (-80.8,26.9)
Pakistan	1739 (651,3415)	0.9 (0.3,1.7)	1911 (894,3236)	0.7 (0.3,1.1)	-26.2 (-55.2,35.2)
Southeast Asia	5205 (2407,9411)	0.9 (0.4,1.6)	3297 (2188,4524)	0.6 (0.4,0.8)	-31.3 (-59.3,61)
Cambodia	331 (82,733)	1.7 (0.4,3.8)	184 (89,309)	1.1 (0.5,1.8)	-35.8 (-67.4,125.9)
Indonesia	1931 (754,3493)	0.9 (0.3,1.6)	1223 (663,2212)	0.6 (0.3,1.1)	-33.4 (-66.7,73.2)
Lao People's Democratic Republic	158 (23,401)	2 (0.3,5.2)	105 (45,200)	1.3 (0.6,2.4)	-37.6 (-63.7,161.4)
Malaysia	64 (34,124)	0.3 (0.1,0.5)	37 (18,85)	0.2 (0.1,0.4)	-39.1 (-72.1,32.9)
Maldives	5 (1,12)	1.3 (0.4,3)	2 (1,3)	0.6 (0.3,1)	-57.1 (-83.4,116.9)

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Mauritius	7 (5,9)	0.6 (0.5,0.8)	4 (3,5)	0.7 (0.5,0.8)	4.5 (-19.6,37.4)
Myanmar	1006 (243,2312)	2 (0.5,4.5)	708 (355,1161)	1.4 (0.7,2.3)	-28.9 (-60.2,124.5)
Philippines	977 (556,1657)	1 (0.6,1.8)	727 (523,1027)	0.7 (0.5,1)	-34.7 (-61.3,22.4)
Seychelles	1 (0,1)	0.7 (0.5,0.9)	1 (0,1)	0.8 (0.5,1.2)	21.9 (-17.1,75.8)
Sri Lanka	94 (55,154)	0.6 (0.3,0.9)	51 (28,84)	0.4 (0.2,0.6)	-35.7 (-68.8,38.5)
Thailand	232 (121,389)	0.5 (0.2,0.8)	58 (32,108)	0.2 (0.1,0.4)	-51.3 (-76.6,-4.3)
Timor-Leste	21 (5,52)	1.3 (0.3,3.3)	16 (9,25)	0.8 (0.5,1.3)	-38 (-67.8,117.1)
Socialist Republic of Viet Nam	369 (148,592)	0.4 (0.2,0.6)	176 (94,291)	0.2 (0.1,0.4)	-40.9 (-73.7,79.5)
Southern Latin America	484 (394,618)	1 (0.8,1.2)	237 (179,297)	0.6 (0.5,0.8)	-33.8 (-52.1,-12.5)
Uruguay	29 (22,35)	1.1 (0.8,1.3)	10 (7,13)	0.6 (0.4,0.8)	-44.7 (-62.7,-23.9)
Argentina	328 (253,433)	1 (0.8,1.3)	187 (137,242)	0.7 (0.5,0.9)	-26.6 (-50.2,2.2)
Chile	128 (108,150)	0.9 (0.7,1)	40 (31,49)	0.4 (0.3,0.5)	-53.7 (-64.5,-39.1)
Southern Sub-Saharan Africa	470 (324,597)	0.6 (0.4,0.8)	389 (215,620)	0.5 (0.3,0.8)	-18.2 (-47.5,15.5)
Botswana	9 (4,15)	0.4 (0.2,0.7)	10 (5,18)	0.5 (0.2,0.8)	10.3 (-28.5,64)
Lesotho	13 (7,20)	0.5 (0.3,0.8)	12 (6,20)	0.6 (0.3,1)	20.7 (-21.2,102.2)
Namibia	11 (6,18)	0.5 (0.3,0.8)	11 (5,20)	0.4 (0.2,0.8)	-9.5 (-49.4,61.9)
South Africa	348 (246,456)	0.7 (0.5,0.9)	232 (139,347)	0.5 (0.3,0.8)	-29.7 (-56.9,3.4)
Kingdom of Eswatini	8 (5,12)	0.6 (0.3,0.8)	8 (4,13)	0.6 (0.3,1)	4.3 (-37.7,85.3)
Zimbabwe	81 (38,142)	0.5 (0.2,0.8)	115 (47,214)	0.6 (0.2,1)	19.6 (-15.3,77.4)
Tropical Latin America	1624 (1325,2058)	1 (0.8,1.3)	1293 (1019,1638)	0.8 (0.6,1)	-21.5 (-44.2,8.6)
Brazil	1586 (1296,2006)	1 (0.9,1.3)	1263 (999,1590)	0.8 (0.6,1)	-21.5 (-43.8,7.5)
Paraguay	38 (22,62)	0.6 (0.4,1)	30 (15,56)	0.5 (0.2,0.9)	-19.5 (-68.1,71.9)
Western Europe	1082 (909,1408)	0.5 (0.4,0.6)	344 (283,424)	0.2 (0.2,0.2)	-63.5 (-73.6,-53.6)

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Andorra	0 (0,0)	0.4 (0.2,0.6)	0 (0,0)	0.1 (0,0.1)	-85.9 (-94.1,-68.9)
Austria	26 (22,34)	0.6 (0.5,0.8)	7 (6,10)	0.2 (0.1,0.3)	-69.4 (-78.8,-56.5)
Belgium	24 (20,32)	0.4 (0.3,0.5)	9 (7,12)	0.2 (0.1,0.2)	-59.7 (-72.2,-44.4)
Cyprus	3 (1,6)	0.5 (0.2,0.9)	1 (0,1)	0.1 (0.1,0.2)	-79.7 (-92.4,-45.1)
Denmark	26 (17,34)	0.9 (0.6,1.2)	7 (5,9)	0.2 (0.2,0.3)	-73.1 (-80.3,-61)
Finland	17 (13,21)	0.6 (0.4,0.7)	4 (3,5)	0.2 (0.1,0.2)	-70.2 (-78.6,-56.1)
France	173 (145,218)	0.5 (0.4,0.6)	61 (45,78)	0.2 (0.1,0.2)	-59.9 (-73.2,-46.1)
Germany	175 (139,261)	0.4 (0.3,0.6)	65 (53,82)	0.2 (0.1,0.2)	-57.6 (-70.5,-44.1)
Greece	22 (18,34)	0.4 (0.4,0.7)	7 (5,10)	0.2 (0.1,0.3)	-59.9 (-78.6,-44.4)
Iceland	1 (1,1)	0.4 (0.3,0.6)	0 (0,0)	0.1 (0.1,0.2)	-69.2 (-80.5,-52.7)
Ireland	14 (12,17)	0.6 (0.5,0.7)	5 (4,6)	0.2 (0.1,0.2)	-67.3 (-75.8,-56.4)
Israel	24 (19,34)	0.5 (0.4,0.7)	11 (9,15)	0.1 (0.1,0.2)	-72.8 (-82.8,-59.4)
Italy	174 (134,195)	0.7 (0.5,0.7)	30 (21,40)	0.2 (0.1,0.2)	-75.1 (-83.2,-63.6)
Luxembourg	0 (0,1)	0.2 (0.2,0.3)	0 (0,0)	0.1 (0,0.1)	-72.3 (-81.7,-56.7)
Malta	2 (2,3)	0.8 (0.6,1)	1 (1,1)	0.4 (0.3,0.5)	-52 (-64.6,-36.4)
Principality of Monaco	0 (0,0)	0.5 (0.3,0.8)	0 (0,0)	0.2 (0.1,0.4)	-55.5 (-75.6,-11.3)
Netherlands	48 (41,61)	0.5 (0.4,0.7)	16 (13,20)	0.2 (0.2,0.2)	-63.1 (-73.5,-54.1)
Norway	16 (7,19)	0.6 (0.3,0.7)	3 (2,5)	0.1 (0.1,0.2)	-77.6 (-83.5,-61.5)
Portugal	43 (36,56)	0.8 (0.7,1)	6 (4,9)	0.2 (0.1,0.2)	-79 (-88,-68.6)
Republic of San Marino	0 (0,0)	0.4 (0.3,0.6)	0 (0,0)	0.1 (0,0.2)	-79.8 (-92.1,-54.5)
Spain	89 (76,119)	0.5 (0.4,0.6)	23 (16,31)	0.1 (0.1,0.2)	-68.7 (-82.3,-57.5)
Sweden	28 (18,33)	0.5 (0.3,0.6)	6 (4,9)	0.1 (0.1,0.2)	-77.7 (-83.3,-65.9)

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Switzerland	28 (18,38)	0.7 (0.5,1)	9 (7,11)	0.2 (0.2,0.3)	-70.8 (-78.7,-55.2)
United Kingdom	146 (127,211)	0.4 (0.4,0.6)	73 (60,91)	0.2 (0.2,0.3)	-43.2 (-59.2,-32.3)
Western Sub-Saharan Africa	7735 (2414,12224)	2 (0.7,3.1)	12742 (7887,17461)	1.6 (1,2.2)	-20.1 (-44.6,76.8)
Benin	214 (69,348)	2 (0.7,3.3)	355 (223,520)	1.5 (0.9,2.2)	-26.9 (-57.2,85.8)
Burkina Faso	489 (127,850)	2.4 (0.6,4.2)	837 (439,1275)	2 (1.1,3)	-18.4 (-50.6,87.5)
Cameroon	416 (136,678)	2 (0.7,3.2)	729 (435,1084)	1.6 (0.9,2.3)	-21.6 (-50.6,65.4)
Chad	192 (56,324)	1.4 (0.4,2.3)	490 (235,772)	1.3 (0.6,2)	-7.2 (-39.8,77.7)
Ghana	406 (156,624)	1.5 (0.6,2.3)	448 (270,772)	1 (0.6,1.8)	-31.8 (-65.2,75.1)
Guinea	334 (80,583)	2.6 (0.6,4.6)	353 (212,531)	1.6 (0.9,2.4)	-40.1 (-67.2,92)
Guinea-Bissau	41 (12,67)	2.1 (0.6,3.4)	33 (20,56)	1.1 (0.6,1.8)	-48.4 (-74.6,45.1)
Liberia	172 (31,326)	3.5 (0.7,6.5)	97 (57,148)	1.3 (0.8,2)	-62 (-81.2,50.8)
Mali	593 (238,1044)	3.2 (1.2,5.6)	850 (465,1265)	1.8 (1,2.8)	-42.7 (-70.7,47.2)
Mauritania	51 (18,83)	1.3 (0.5,2.2)	49 (25,84)	0.8 (0.4,1.4)	-40.5 (-70.6,53.8)
Niger	372 (79,693)	2 (0.4,3.8)	514 (274,781)	1 (0.5,1.5)	-50.4 (-74.9,58.9)
Nigeria	3331 (938,5403)	1.9 (0.5,3.1)	6804 (3567,9968)	1.8 (1,2.6)	-3.6 (-32.2,104.2)
Sao Tome and Principe	4 (1,5)	1.7 (0.7,2.6)	1 (0,3)	0.6 (0.2,1.2)	-65.3 (-89.3,31.2)
Senegal	254 (85,395)	1.7 (0.6,2.6)	206 (109,372)	0.9 (0.5,1.7)	-43.1 (-75.8,70)
Sierra Leone	280 (60,528)	3.2 (0.7,5.9)	244 (143,355)	1.8 (1,2.6)	-43.8 (-69.9,89.1)
Togo	109 (45,161)	1.5 (0.7,2.3)	109 (69,178)	1 (0.6,1.6)	-35.3 (-63.7,41.7)
Republic of Coate d'Ivoire	444 (151,686)	1.8 (0.7,2.8)	592 (385,858)	1.4 (0.9,2)	-23.5 (-53.7,82.3)
Republic of Cabo Verde	8 (4,12)	1.3 (0.7,2)	2 (1,4)	0.5 (0.2,1)	-62.6 (-88,-9.2)
Republic of the Gambia	24 (10,36)	1.2 (0.5,1.8)	28 (17,48)	0.8 (0.5,1.4)	-31.7 (-65.7,54.2)

95% UI=95% uncertainty intervals.

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Table S3: DALYs due to digestive congenital anomalies in 1990-2021 among aged 0-14 years and the percentage change in the age-standardized rates (ASRs) per 100,000, by location (Generated from data available from https://vizhub.healthdata.org/gbd-results/)

	1990		2021		Percentage change in the ASRs per 100 000
	No(95%UI)	ASRs per 100 000 (95%UI)	No(95%UI)	ASRs per 100 000 (95%UI)	
Global	6765566 (3775260,10452446)	108.3 (60.9,166.7)	4324562 (3246584,5390461)	70.4 (53.1,87.6)	-35 (-57.1,15.5)
Andean Latin America	96188 (50308,154648)	175.6 (92.2,282)	53932 (38125,71827)	92.3 (65.5,122.4)	-47.4 (-71.2,7.3)
Plurinational State of Bolivia	31296 (11643,60674)	295.7 (110.4,571)	19172 (12382,26740)	166.3 (107.7,231.5)	-43.8 (-69.7,42.2)
Ecuador	11325 (9220,14761)	81.3 (66.4,105.6)	14808 (10740,19858)	97.2 (70.8,129.8)	19.6 (-21,73.2)
Peru	53568 (26044,89453)	177.6 (87.4,295.6)	19952 (11862,30166)	63.3 (38.6,94.8)	-64.3 (-83.9,-13.1)
Australasia	7015 (6204,8599)	47.1 (41.6,57.6)	2354 (1830,3511)	14.2 (11.2,21.1)	-69.8 (-76.8,-57.8)
Australia	5707 (4856,7225)	47.2 (40.2,59.7)	1858 (1396,2925)	13.6 (10.3,21.3)	-71.2 (-78.9,-58.8)
New Zealand	1308 (1017,1512)	46.6 (36.5,53.7)	496 (389,664)	17.3 (13.7,23.1)	-62.9 (-71.8,-49.7)
Caribbean	71001 (40888,116397)	168.6 (97.5,275.7)	43694 (26142,69734)	116.1 (70.1,184.3)	-31.1 (-53.5,11.4)
Antigua and Barbuda	17 (13,28)	30.5 (23.3,48.9)	13 (10,19)	26.2 (21.3,39.6)	-14.3 (-35.2,13.5)
Barbados	148 (118,182)	75.1 (60.3,92.1)	82 (57,115)	65.6 (45.9,91.4)	-12.7 (-41,23.8)
Belize	319 (231,400)	107.3 (78,134.6)	259 (202,333)	71.2 (55.7,91.4)	-33.6 (-51.4,-7.2)
Bermuda	18 (11,26)	43 (26.2,61.6)	6 (4,9)	24.5 (15.6,38.4)	-43 (-65.4,-10.7)
Commonwealth of the Bahamas	102 (74,131)	39.7 (28.9,51)	56 (39,79)	29.4 (20.6,41.4)	-26 (-47.5,9.6)
Cuba	12941 (9023,15729)	152.9 (106.7,185.7)	2394 (1946,3009)	50 (41,62.9)	-67.3 (-76,-52.5)

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Dominica	42 (27,63)	48.8 (30.9,72)	30 (19,45)	96.6 (59.1,143.1)	98.1 (24.7,206.9)
Dominican Republic	18405 (9681,28431)	174.7 (92.3,270.5)	8815 (4747,16927)	87.2 (47.3,166.2)	-50.1 (-76.4,-2.8)
Grenada	43 (29,67)	37.8 (25.8,59.5)	19 (14,27)	30.7 (22.1,42.2)	-18.8 (-40.7,16.9)
Guyana	1365 (952,1705)	112.1 (79,139.2)	548 (362,779)	77.8 (51.9,110.2)	-30.6 (-55.3,2.5)
Haiti	28162 (9552,66082)	245.8 (82.6,575.8)	27114 (11680,50982)	169.4 (73,316.7)	-31.1 (-58.4,40.9)
Jamaica	2713 (1983,3561)	99.1 (72.6,129.7)	1139 (826,1567)	72.1 (52.4,99.3)	-27.2 (-52.3,8.2)
Puerto Rico	1834 (1491,2222)	59.4 (48.3,71.9)	389 (272,510)	43.7 (30.8,57.3)	-26.5 (-47,-3.6)
Saint Kitts and Nevis	31 (23,39)	70.4 (52.2,88.3)	15 (11,20)	53.7 (40.6,71.4)	-23.7 (-44.6,7.7)
Saint Lucia	107 (74,154)	63.4 (44.3,91.4)	38 (27,59)	47.8 (33.2,73.1)	-24.7 (-52.4,18.4)
Saint Vincent and the Grenadines	128 (90,164)	104.4 (73.9,134.1)	39 (29,53)	61.7 (45.6,83.8)	-40.9 (-59.8,-9.7)
Suriname	933 (500,1323)	214.8 (116,304.1)	647 (413,954)	152.6 (97.8,225)	-29 (-57.7,17.5)
Trinidad and Tobago	1234 (947,1534)	107 (82.2,132.8)	605 (435,818)	84.8 (61.1,114.5)	-20.8 (-47,16)
United States Virgin Islands	55 (32,91)	50.6 (29.9,82.9)	6 (3,15)	19 (9.3,43.7)	-62.4 (-82.5,-27.1)
Central Asia	67143 (52615,84743)	72.6 (57.2,91.5)	55814 (44310,71006)	57.8 (46.1,73.4)	-20.4 (-38.8,6.4)
Armenia	6875 (3952,9541)	189.9 (109.8,263.1)	1743 (1223,2297)	104.7 (73.5,137.4)	-44.8 (-62.7,-9.8)
Azerbaijan	6501 (3454,11073)	74.7 (40.1,126.6)	3121 (1773,5146)	48.7 (27.8,80)	-34.9 (-66.2,24.5)
Georgia	2054 (1286,2907)	49.9 (31.5,70.1)	969 (681,1300)	45.4 (32.3,60.8)	-8.9 (-45.2,64.6)
Kazakhstan	15424 (10735,19663)	87.8 (61.7,111.6)	11646 (8513,16279)	60.8 (45,84.2)	-30.8 (-53.8,-1.9)
Kyrgyzstan	7640 (4835,9896)	122.1 (77.8,157.6)	6789 (5484,8417)	91.2 (73.8,112.6)	-25.3 (-49,14.6)
Mongolia	7574 (3655,14267)	222.3 (107.8,417.5)	3166 (1996,4450)	87 (55.3,121.9)	-60.9 (-80.9,-13.3)
Tajikistan	4981 (2768,7877)	51.4 (28.9,81.1)	6679 (3390,12076)	50 (25.7,89.6)	-2.7 (-49.7,115.7)

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Turkmenistan	5758 (3831,7779)	97.8 (65.6,131.9)	7221 (4288,10626)	137.9 (82.2,202.1)	40.9 (-4.2,103.9)
Uzbekistan	10336 (7173,18521)	31.4 (22.1,56.1)	14480 (9108,23620)	38.8 (24.8,62.5)	23.5 (-23.4,99.3)
Central Europe	81876 (61445,105650)	98.1 (73.7,126.4)	13277 (10438,16543)	26.5 (20.9,32.9)	-73 (-82.1,-60.4)
Albania	1457 (829,2279)	37.8 (21.6,58.9)	339 (178,629)	25.5 (13.5,47)	-32.4 (-65.1,23.4)
Bosnia and Herzegovina	1100 (549,1775)	34 (17.1,54.8)	227 (134,458)	17.1 (10.3,34.3)	-49.6 (-70.6,-8)
Bulgaria	5117 (4145,6700)	105 (85.4,137.3)	885 (665,1144)	32.1 (24.3,41.2)	-69.4 (-81.2,-56.7)
Croatia	1993 (1614,2397)	73.9 (59.8,88.8)	436 (321,567)	26 (19.4,33.7)	-64.8 (-75.7,-51.5)
Czech Republic	4435 (3365,5367)	71.6 (54.5,86.7)	502 (335,714)	10.2 (6.9,14.2)	-85.8 (-90.5,-77.5)
Hungary	5636 (4387,6561)	93.8 (73.2,109.2)	725 (514,1043)	17.5 (12.5,24.9)	-81.4 (-87.6,-69.6)
Montenegro	228 (134,374)	47.5 (28.1,77.7)	30 (15,61)	9.3 (4.7,18.4)	-80.5 (-91.3,-56.3)
North Macedonia	2254 (973,4139)	138.1 (59.8,253)	237 (140,368)	26.1 (15.7,40.5)	-81.1 (-91.5,-49)
Poland	22943 (17915,28323)	86.5 (67.6,106.8)	3811 (2727,5129)	23.1 (16.6,31)	-73.3 (-83.5,-61.7)
Romania	26518 (16348,37098)	175.5 (108.7,244.5)	4417 (3444,5374)	51.4 (40.3,62.4)	-70.7 (-79,-56.1)
Serbia	6163 (3153,9957)	93.3 (48.1,150.5)	679 (394,1346)	21.2 (12.5,41.7)	-77.3 (-90.3,-30.1)
Slovakia	2147 (1572,2980)	56.3 (41.4,78)	717 (465,1152)	27.1 (17.6,43.1)	-52 (-72.3,-21.6)
Slovenia	576 (463,684)	53.3 (42.8,63.2)	79 (57,126)	9.2 (6.7,14.4)	-82.7 (-87.9,-70.7)
Central Latin America	238043 (204970,295059)	101.8 (87.8,125.8)	172866 (128905,224318)	93.1 (69.6,120.4)	-8.6 (-38.7,26.5)
Colombia	40920 (34046,50240)	94.8 (79.1,116.4)	24694 (16972,35447)	77 (53.1,109.9)	-18.8 (-45.2,19.8)
Costa Rica	3889 (3238,4620)	100.2 (83.6,119.3)	1916 (1508,2418)	73.4 (58.3,91.9)	-26.8 (-42.7,-5.7)
El Salvador	5129 (2431,8063)	63.3 (30.4,99.5)	1489 (672,3234)	27.3 (12.6,58.1)	-57 (-83.7,9.3)

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Guatemala	6971 (5265,10389)	44 (33.5,65)	12727 (9250,18582)	89.4 (65.1,130.1)	103.4 (40.9,183.3)
Honduras	11250 (6824,16758)	134.4 (81.9,199.3)	7211 (4407,11000)	69.3 (42.5,105.3)	-48.4 (-73.3,-2.8)
Mexico	126995 (108990,159330)	106.7 (91.7,133.4)	83721 (61043,109287)	92.9 (68.4,120.7)	-12.9 (-41.3,22)
Nicaragua	15075 (7857,24963)	224.8 (117.7,372.4)	6560 (4088,9966)	107.6 (67.6,162.7)	-52.1 (-77.4,8.8)
Panama	3583 (2888,4392)	127.7 (103.1,156)	3537 (2612,4606)	104.6 (77.2,135.8)	-18.1 (-43.5,15.5)
Bolivarian Republic of Venezuela	24232 (19806,29137)	94 (77.2,112.8)	31011 (21935,42166)	145.4 (103.1,197.2)	54.7 (7.8,109.8)
Central Sub-Saharan Africa	165360 (41168,320477)	142.8 (36.6,275.3)	148021 (79981,256282)	71.3 (39.2,122.6)	-50.1 (-71,21.9)
Angola	32028 (6217,69092)	144.6 (29.4,310)	44750 (22558,69968)	79.8 (41.4,124)	-44.8 (-70,71.7)
Central African Republic	9162 (1949,19892)	162.1 (36.2,351)	9790 (3523,17142)	112.4 (41.9,195.4)	-30.7 (-54.9,39.9)
Congo	4878 (1666,8725)	116.8 (41.1,208.1)	4052 (2435,6972)	67.7 (41.7,116.4)	-42.1 (-66.5,37.6)
Democratic Republic of the Congo	116663 (29655,217304)	143.7 (37.4,267.1)	86743 (46948,157483)	65.2 (36.5,117.4)	-54.6 (-76.5,17.2)
Equatorial Guinea	1023 (268,2090)	111.5 (30.3,225.5)	1429 (758,2315)	80.8 (44,131.1)	-27.5 (-62.3,124.3)
Gabon	1605 (592,2952)	98 (37.6,179.2)	1257 (680,2079)	62.1 (34.1,102.7)	-36.6 (-64.8,45.5)
East Asia	1299821 (699293,2351758)	114.2 (61.8,206.2)	232392 (148764,340916)	40.1 (25.6,59)	-64.9 (-83.4,-19.7)
China	1270295 (678297,2310570)	115.8 (62.2,210.1)	225105 (144205,330493)	40.4 (25.8,59.4)	-65.1 (-83.7,-19.3)
Democratic People's Republic of Korea	23436 (13135,37150)	93.2 (52.8,147.1)	5931 (3238,9791)	42.4 (23.4,69.4)	-54.5 (-78.9,-2.2)
Taiwan (Province of China)	6089 (4874,6936)	39.7 (31.9,45.1)	1356 (1082,1747)	18.3 (14.7,23.4)	-53.9 (-64.6,-35.3)
Eastern Europe	159950 (127744,188245)	110.1 (88,129.4)	27425 (20624,36023)	31.9 (24.3,41.4)	-71 (-80.1,-57.7)

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Belarus	6157 (4483,7864)	89.4 (65.2,114)	1080 (666,1616)	27.4 (17.2,40.7)	-69.4 (-81.2,-51.4)
Estonia	500 (371,609)	47.9 (35.5,58.3)	40 (25,75)	6.9 (4.5,12.8)	-85.6 (-91.4,-71.2)
Latvia	967 (714,1261)	54.7 (40.6,71)	70 (43,129)	9.2 (5.7,16.5)	-83.2 (-91.2,-68.2)
Lithuania	2295 (1856,2778)	85.4 (69.2,103.2)	222 (156,320)	20 (14.3,28.4)	-76.6 (-85,-65.2)
Republic of Moldova	7263 (4528,10615)	189.4 (118.6,276.1)	1156 (838,1615)	85 (61.7,118.5)	-55.1 (-69.6,-26.6)
Russian Federation	111076 (89640,128853)	114.9 (92.8,133.2)	20347 (14390,27499)	31.4 (22.4,42.1)	-72.6 (-82,-60.1)
Ukraine	31693 (23733,40131)	97.9 (73.5,123.8)	4510 (3169,6431)	33.6 (23.7,47.8)	-65.7 (-78,-45.3)
Eastern Sub-Saharan Africa	611204 (144359,1254328)	152.5 (37.5,312.2)	592000 (325216,955784)	92.7 (52.8,148.7)	-39.2 (-65,56)
Burundi	18278 (3561,38275)	156.3 (32.4,326.4)	17037 (8165,28336)	78.6 (39.4,129.9)	-49.7 (-74.2,39.4)
Comoros	1372 (337,2771)	152.5 (39.8,305.2)	773 (386,1398)	96.6 (49.5,174.2)	-36.6 (-67.3,43.8)
Djibouti	770 (267,1484)	108.9 (38.8,209)	960 (488,1882)	67.6 (34.6,132.3)	-37.9 (-70.9,45.4)
Eritrea	7067 (1675,14544)	106.1 (26.4,216.7)	7210 (3670,14352)	79.5 (42,157.2)	-25.1 (-65.5,103.1)
Ethiopia	162151 (35071,355594)	150.9 (34.4,329.6)	126936 (68196,220082)	78.4 (44.3,134.6)	-48.1 (-74,44.5)
Kenya	41789 (16426,78920)	92.2 (37.2,173.1)	34077 (20129,65937)	61 (36.2,117.6)	-33.9 (-68.3,45.5)
Madagascar	31743 (8355,65489)	134.9 (36.8,278.8)	33962 (15971,57826)	85.4 (41.7,145)	-36.7 (-64.5,45.3)
Malawi	42787 (8686,89686)	193.2 (40.6,409.6)	23469 (13940,38490)	87.8 (53.3,143.9)	-54.5 (-80.7,68.8)
Mozambique	54756 (10749,121213)	203 (41.4,450.9)	56239 (26764,99582)	109.4 (53.8,192.1)	-46.1 (-72.2,59.9)
Rwanda	24002 (4284,49923)	167.9 (31.9,348.6)	13997 (7173,23926)	81.1 (42.5,137.5)	-51.7 (-76.8,63.6)

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Somalia	20039 (4409,45311)	116.3 (27.1,261.3)	34942 (11618,69310)	79.6 (28.1,156.7)	-31.5 (-58.4,30.7)
South Sudan	17969 (3301,40832)	157.8 (30.4,359.5)	27494 (7297,54568)	159.2 (43.7,316.6)	0.9 (-31.3,91)
Uganda	49881 (10100,103916)	121 (25.9,252.6)	71679 (33578,113609)	97.4 (47.6,153.6)	-19.5 (-54.2,117.5)
United Republic of Tanzania	106802 (23036,226953)	197.9 (44.4,418.8)	112620 (54910,174649)	127.3 (63.3,197)	-35.7 (-64.1,80.8)
Zambia	31362 (6787,65799)	185.1 (41.9,389.8)	30091 (17881,50835)	105.9 (63.1,177.7)	-42.8 (-78,134.7)
High-income Asia Pacific	40566 (31975,51216)	42.9 (33.9,53.9)	8157 (6281,10848)	14.7 (11.5,19.3)	-65.6 (-77,-50.9)
Brunei Darussalam	126 (88,180)	38.9 (27.6,55.4)	101 (65,143)	35 (22.8,49.1)	-10 (-37.3,37.8)
Japan	25003 (20684,31231)	41.5 (34.4,51.7)	6141 (4693,7908)	15.5 (11.9,19.7)	-62.7 (-75.7,-50.6)
Republic of Korea	14206 (8437,21442)	44.6 (26.8,67)	1655 (1057,3062)	12.8 (8.3,23.4)	-71.2 (-84.9,-31.6)
Singapore	1231 (963,1565)	53.6 (42.4,67.6)	260 (191,392)	10.8 (8.1,15.6)	-79.8 (-86.4,-71.3)
High-income North America	66294 (60620,84008)	31.8 (29,40.1)	40097 (31726,47453)	21.7 (17.3,25.4)	-31.8 (-51.2,-20.2)
Canada	6489 (5628,8217)	34.3 (29.8,43.2)	3193 (2415,4056)	18.7 (14.3,23.5)	-45.4 (-62.5,-28.7)
Greenland	46 (23,78)	82.3 (40.9,138.6)	11 (7,19)	31.1 (19,52.3)	-62.2 (-81.9,-6.8)
United States of America	59757 (54619,75578)	31.5 (28.8,39.7)	36892 (29100,43611)	22 (17.4,25.8)	-30.3 (-49.7,-18.5)
North Africa and Middle East	927411 (330053,1814572)	180.2 (64.8,352.2)	385822 (268906,506203)	67.8 (47.6,88.8)	-62.4 (-78.4,-10.9)
Afghanistan	46749 (8803,115122)	236.1 (44.6,577.4)	72684 (35265,128791)	128.8 (62.7,227.9)	-45.4 (-68.6,66.6)
Algeria	61182 (25832,112032)	167.6 (71.4,305.9)	30503 (19357,43629)	70.3 (45,100.1)	-58.1 (-78.9,1.1)
Bahrain	394 (210,625)	63.3 (34.2,99.6)	155 (94,301)	18.7 (11.5,36.1)	-70.4 (-85.6,-43.6)
Egypt	162188 (40958,340276)	184 (47.1,384.8)	66195 (45336,95441)	54 (37.3,77.9)	-70.6 (-86.8,17.4)

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Islamic Republic of Iran	131468 (61126,225689)	174.2 (81.4,298.1)	11053 (6330,16361)	22.1 (12.8,32.5)	-87.3 (-95,-66.5)
Iraq	37875 (12076,72972)	117.4 (38.3,225.2)	20450 (13473,32755)	51.8 (34.3,82.5)	-55.9 (-80.5,30.6)
Jordan	8327 (4830,12776)	133.6 (78.1,204.1)	6726 (4551,9690)	65.5 (44.5,93.9)	-51 (-72.9,-2.2)
Kuwait	1633 (1173,2075)	98.4 (70.6,125)	1384 (1037,1836)	57.9 (43.6,76.4)	-41.2 (-59.8,-9.4)
Lebanon	4657 (1625,9502)	116.1 (41.2,236.1)	1424 (911,2194)	38.1 (24.6,58.1)	-67.2 (-85.8,-12.2)
Libya	8851 (4612,14734)	142.7 (75.3,236.5)	3931 (2025,6772)	101.5 (52.5,173.9)	-28.9 (-54.8,13.2)
Morocco	24195 (9377,46737)	65.8 (25.8,126.3)	7192 (4048,14775)	24 (13.6,48.7)	-63.5 (-85.4,-7.5)
Oman	1553 (706,2913)	46.3 (21.6,86)	856 (461,2162)	23 (12.5,57.1)	-50.3 (-80.1,15)
Palestine	3512 (1777,5851)	85.8 (43.9,142.6)	1857 (1122,3281)	32.6 (20,57.2)	-62 (-83.3,-17.4)
Qatar	166 (84,346)	31.8 (16.8,65)	179 (94,484)	10.8 (6,27.2)	-66.2 (-83.8,-34.1)
Saudi Arabia	19388 (9450,32263)	80.9 (40.1,134)	2983 (1254,7608)	14.6 (6.8,35.5)	-81.9 (-93.9,-52)
Sudan	96103 (15148,292776)	243.8 (38.9,747.1)	62989 (36912,100358)	115.2 (67.9,182.7)	-52.7 (-81.1,97.6)
Syrian Arab Republic	27844 (10785,56489)	128.7 (50.5,259.7)	4063 (2427,6767)	43.3 (25.9,71.6)	-66.3 (-86.4,-2.8)
Tunisia	15954 (6177,30387)	152.8 (59.8,290.4)	3638 (2375,5389)	45.6 (30,67.8)	-70.2 (-86.4,-25.1)
Turkey	214304 (60837,413720)	306.8 (88,591.4)	37205 (26457,51733)	76.4 (54.4,105.8)	-75.1 (-89.6,-17.8)
United Arab Emirates	1974 (1065,3451)	86.7 (47.6,150.8)	867 (438,1491)	24.1 (12.2,41.2)	-72.2 (-88.5,-42.2)
Yemen	58583 (12730,153960)	194.7 (42.7,515.1)	49131 (26238,82670)	106.5 (57.2,178.7)	-45.3 (-72.1,71.7)
Oceania	2978 (1127,6557)	29.2 (11.7,63.1)	5439 (2138,13123)	28 (11.8,65.8)	-4.1 (-41.8,52)
American Samoa	8 (4,26)	11 (5.3,31.9)	3 (1,11)	9 (4.3,35.5)	-18 (-61.7,48.5)
Cook Islands	2 (1,7)	11.5 (6.3,33.7)	1 (0,2)	7.3 (3,23.7)	-36.6 (-70.9,54.9)
Federated States of Micronesia	34 (14,75)	24 (10,50.2)	11 (5,35)	13.1 (6.6,39.6)	-45.4 (-75.5,37.1)

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Fiji	224 (126,408)	25.9 (14.9,45.6)	283 (145,484)	33.7 (17.8,56.5)	30.3 (-22.5,134.3)
Guam	19 (7,58)	11.4 (4.9,33.4)	11 (5,47)	10 (4.9,38)	-11.9 (-54.5,49.3)
Kiribati	39 (12,83)	32.4 (10.3,66.9)	28 (12,71)	21.1 (9.7,51.4)	-34.7 (-64.6,24)
Marshall Islands	11 (5,29)	16.7 (7.8,41.9)	7 (3,23)	14.8 (6.9,42.5)	-11.4 (-48.2,48.3)
Republic of Nauru	3 (2,8)	21.1 (10.3,49.8)	2 (1,7)	19.4 (9.1,48.8)	-8.1 (-44,54)
Republic of Niue	0 (0,1)	20.3 (10,52.8)	1 (0,2)	54.9 (28.4,156.2)	169.9 (64.6,310.4)
Northern Mariana Islands	5 (3,17)	11.2 (5.6,30.6)	1 (0,2)	3.3 (1.7,8.5)	-70.8 (-85.7,-43)
Republic of Palau	4 (2,9)	28.5 (12.8,61.8)	1 (1,4)	17.3 (9.7,44.3)	-39.3 (-65.5,3.6)
Papua New Guinea	2188 (664,5387)	32.7 (10.6,79.4)	4607 (1645,11179)	29.7 (11.4,70.2)	-9.2 (-50.2,56.7)
Samoa	47 (22,115)	19.4 (9.5,45.6)	32 (14,109)	12.1 (6,37.5)	-37.7 (-72.3,31.6)
Solomon Islands	128 (52,310)	21 (9.1,48.9)	139 (60,449)	15.7 (7.4,47.2)	-25.2 (-62.3,50.7)
Tokelau	0 (0,1)	18.5 (9.1,57.3)	0 (0,2)	57.1 (19.8,216)	209.4 (15.8,618.4)
Tonga	20 (10,61)	13.7 (7.5,39.9)	13 (5,49)	10.2 (4.9,35.2)	-25.1 (-61.8,36.1)
Tuvalu	5 (2,11)	33.4 (11.2,70.7)	2 (1,5)	15.6 (7.6,43.9)	-53.3 (-80.7,23.7)
Vanuatu	48 (19,123)	17.7 (7.6,43.4)	54 (24,152)	14 (6.6,37.4)	-20.5 (-53,38.3)
South Asia	1420099 (624058,2597525)	89 (39.8,161.7)	875768 (498385,1459053)	58.8 (33.9,97.4)	-33.9 (-63.1,47.2)
Bangladesh	211189 (61855,481534)	107.8 (32.4,244.6)	61805 (26011,125274)	46.6 (19.8,94.6)	-56.7 (-82.6,35.8)
Bhutan	957 (248,2265)	93.3 (25,219)	312 (130,631)	53 (22.3,106.1)	-43.2 (-79.8,104.9)
India	1028625 (482918,1825289)	88.1 (41.9,155.4)	630021 (360769,1071077)	61 (35.2,102.9)	-30.8 (-62.2,55.4)

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Nepal	20915 (7113,40510)	58.3 (20.5,111.8)	8538 (4085,20199)	28.6 (14,66.8)	-50.9 (-79.8,24.1)
Pakistan	158412 (60538,308938)	81.2 (31.8,156.9)	175093 (84352,294210)	60.1 (29.6,100.7)	-26 (-54.7,33.7)
Southeast Asia	474034 (224259,850165)	81.7 (39,146.2)	303106 (203607,413264)	56.7 (38.3,77.3)	-30.6 (-58.6,58.9)
Cambodia	29904 (7627,65745)	153.6 (39.3,337.1)	16725 (8223,27969)	99.1 (49.1,165)	-35.5 (-67,120.2)
Indonesia	176103 (71279,315073)	79.7 (32.5,142.2)	112266 (62075,200540)	53.5 (29.7,95.3)	-32.9 (-65.8,70.6)
Lao People's Democratic Republic	14251 (2171,35990)	183.9 (28.3,466.6)	9555 (4143,18058)	115.5 (51.1,217.5)	-37.2 (-63.3,151.7)
Malaysia	6051 (3317,11503)	26.3 (14.8,49.4)	3669 (1917,8047)	16.7 (9.1,35.7)	-36.5 (-69,30.1)
Maldives	490 (133,1099)	118.7 (32.9,264.2)	152 (91,278)	52.3 (31.6,95.5)	-56 (-82.7,110.2)
Mauritius	622 (482,794)	57.8 (44.9,73.7)	364 (291,444)	60.7 (48.6,73.7)	4.9 (-18.6,36.1)
Myanmar	90634 (22496,206880)	175.9 (43.9,401.9)	64265 (32465,104695)	126.1 (64.2,204.7)	-28.3 (-59.7,122)
Philippines	88789 (51434,149325)	94.7 (55.2,158.7)	66922 (48727,94384)	62.3 (45.7,87.5)	-34.2 (-60.5,20.8)
Seychelles	48 (33,66)	62.3 (42.6,85.5)	58 (36,84)	77.1 (48.8,112.8)	23.7 (-15.3,77.9)
Sri Lanka	8656 (5165,14058)	51.3 (31.1,82.8)	4779 (2775,7828)	33.6 (19.8,54.6)	-34.5 (-67.6,38.1)
Thailand	21541 (11639,35591)	43.4 (23.7,71.4)	5501 (3244,9911)	21.5 (12.8,38.5)	-50.4 (-75.2,-5.3)
Timor-Leste	1888 (482,4635)	121 (30.7,295.8)	1434 (863,2253)	75.5 (45.9,117.8)	-37.7 (-67.3,107.1)
Socialist Republic of Viet Nam	34370 (14366,54093)	37.7 (16.1,58.9)	16995 (9792,27440)	23.2 (13.5,36.9)	-38.6 (-71.4,70.5)
Southern Latin America	44158 (36053,56205)	88 (72.2,111.8)	22116 (16985,27673)	59.4 (45.8,74.2)	-32.5 (-50.8,-11.4)
Uruguay	2611 (1988,3230)	97.8 (74.8,120.8)	939 (712,1218)	55.2 (42,71.4)	-43.6 (-61.5,-23.1)

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Argentina	29836 (23164,39342)	90.2 (70.4,118.9)	17352 (12783,22300)	67.2 (49.6,86.3)	-25.6 (-49.3,2.8)
Chile	11708 (9893,13685)	81.2 (68.8,94.6)	3823 (3074,4696)	39.6 (32,48.3)	-51.2 (-62.2,-36.7)
Southern Sub-Saharan Africa	42939 (29917,54502)	58 (40.7,73.7)	35851 (20276,56529)	47.5 (27.3,74.3)	-18.1 (-46.7,14.5)
Botswana	805 (379,1360)	38.7 (19,64.2)	964 (480,1636)	43.1 (21.9,72.6)	11.4 (-26.7,63.9)
Lesotho	1195 (682,1819)	48.8 (28.3,73.8)	1112 (582,1771)	57.7 (30.6,90.8)	18.3 (-22.6,92.8)
Namibia	993 (539,1603)	43.2 (23.8,68.7)	1026 (456,1834)	39.1 (17.8,69)	-9.6 (-48.3,59.5)
South Africa	31679 (22573,41315)	65.9 (47.2,85.6)	21470 (13032,31644)	46.7 (28.7,68.4)	-29.2 (-55.5,3.4)
Kingdom of Eswatini	755 (461,1073)	52 (32.2,73.5)	711 (382,1225)	53.7 (29.4,91.1)	3.3 (-37.9,81.4)
Zimbabwe	7513 (3580,12973)	42.6 (20.9,72.4)	10568 (4461,19394)	49.9 (21.4,90.2)	17.1 (-17.1,73.3)
Tropical Latin America	151289 (124875,189759)	95.1 (78.6,119)	120661 (95772,151604)	74.5 (59.7,92.9)	-21.6 (-43.6,6.7)
Brazil	147778 (122051,185059)	96.6 (80.1,120.7)	117782 (93790,147865)	75.6 (60.6,94.1)	-21.7 (-43.4,5.5)
Paraguay	3511 (2140,5658)	58 (35.6,92.7)	2879 (1475,5209)	47.5 (25,84.9)	-18.1 (-65.4,69.3)
Western Europe	101225 (85261,130561)	46.6 (39.3,59.8)	34488 (28936,42732)	18.4 (15.4,22.6)	-60.7 (-71.2,-51.2)
Andorra	10 (5,16)	38.4 (21.2,60.6)	2 (1,2)	7.1 (4.6,10.2)	-81.5 (-90.5,-63.2)
Austria	2466 (2096,3103)	57.1 (48.7,71.3)	731 (574,968)	19.2 (15.2,25.1)	-66.4 (-76.1,-54.2)
Belgium	2271 (1908,2961)	39 (33,50.5)	889 (685,1205)	16.9 (13.2,22.5)	-56.7 (-69.2,-42)
Cyprus	324 (146,546)	50.5 (23.3,84.2)	78 (47,138)	11.7 (7.4,20)	-76.7 (-90.1,-42.8)
Denmark	2417 (1598,3094)	81.5 (54.3,104)	680 (528,858)	23.5 (18.3,29.2)	-71.2 (-78.7,-58.9)
Finland	1598 (1241,1946)	52.8 (41.2,64.3)	373 (289,509)	17.1 (13.5,22.9)	-67.6 (-75.9,-53.8)
France	16086 (13574,20134)	44.7 (37.9,55.7)	6037 (4643,7622)	19.1 (14.8,23.9)	-57.4 (-71.2,-43.6)

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Germany	16386 (13140,24260)	39.6 (32,58.2)	6444 (5331,8120)	18 (15.1,22.3)	-54.5 (-67.5,-41.3)
Greece	2099 (1713,3148)	42 (34.4,62.8)	694 (526,962)	18.3 (14,24.8)	-56.6 (-75.7,-41)
Iceland	88 (63,113)	41.8 (30,52.8)	30 (22,42)	15.1 (11.6,20.4)	-63.9 (-75.4,-47.9)
Ireland	1339 (1098,1579)	51.8 (42.7,61)	478 (382,614)	18.2 (14.7,23.1)	-64.8 (-73.3,-54.1)
Israel	2254 (1727,3062)	45.6 (35,61.3)	1143 (897,1503)	13.8 (10.9,18.1)	-69.7 (-79.6,-57)
Italy	16107 (12513,18014)	60.7 (47.5,68.1)	3182 (2351,4106)	16.8 (12.6,21.7)	-72.3 (-80.7,-60.5)
Luxembourg	48 (40,70)	21.4 (17.7,30.2)	21 (15,39)	7.2 (5.4,13.1)	-66.3 (-75.2,-53.2)
Malta	193 (151,241)	73.5 (57.7,91.1)	75 (57,97)	37.1 (28.5,47.2)	-49.6 (-62.1,-33.7)
Principality of Monaco	4 (3,7)	39 (24.9,58.1)	1 (1,2)	9.7 (5.4,15.6)	-75.1 (-87.8,-50.4)
Netherlands	4522 (3814,5662)	49.4 (41.9,61.4)	1584 (1317,1925)	19.8 (16.6,23.8)	-60 (-70.9,-51.2)
Norway	1479 (718,1766)	53.3 (26.6,63.4)	333 (208,460)	13 (8.3,17.9)	-75.5 (-80.8,-59.7)
Portugal	3997 (3294,5142)	72.5 (59.8,92.9)	621 (440,836)	16.5 (12,21.9)	-77.3 (-86.5,-67)
Republic of San Marino	5 (3,8)	42.6 (24.4,69.4)	3 (1,5)	19.6 (10.2,33.1)	-54.1 (-74.4,-12.2)
Spain	8256 (7113,11040)	43.2 (37.2,57.6)	2328 (1655,3045)	14.7 (10.6,19.2)	-65.9 (-79.6,-55)
Sweden	2632 (1762,3076)	46 (31.2,53.5)	617 (460,876)	12.1 (9.1,16.8)	-73.8 (-79.3,-62.1)
Switzerland	2643 (1673,3524)	67.3 (43,89.6)	859 (691,1065)	21.4 (17.3,26.2)	-68.2 (-76.1,-52.8)
United Kingdom	13916 (12177,19791)	38.4 (33.6,53.8)	7256 (6049,9172)	22.8 (19.3,28.6)	-40.5 (-56.2,-30.1)
Western Sub-Saharan Africa	696973 (223980,109586 3)	176.4 (57.6,279)	1151281 (718892,157545 9)	141 (89,192.8)	-20.1 (-44.3,76.9)

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Benin	19315 (6292,31281)	182.5 (60.1,296.7)	32127 (20410,46797)	133.8 (85.5,194.6)	-26.7 (-56.7,85.8)
Burkina Faso	44093 (11711,76212)	213.4 (56.9,371.4)	75640 (40149,114876)	174.5 (94.5,265.1)	-18.2 (-50.3,89)
Cameroon	37476 (12578,60817)	175.5 (60.2,282.9)	65980 (39587,97610)	137.6 (83.3,203.2)	-21.5 (-50.4,65.8)
Chad	17390 (5217,29180)	124.3 (38,208.9)	44229 (21524,69250)	114.8 (56,178.7)	-7.7 (-39.6,75.8)
Ghana	36695 (14271,56100)	134 (53.5,203.5)	40848 (24945,69803)	91.3 (56,156.1)	-31.8 (-65,74.8)
Guinea	30078 (7407,52130)	233.2 (57.8,410.8)	31947 (19417,47942)	139.5 (84.8,208.2)	-40.2 (-67,89.4)
Guinea-Bissau	3668 (1102,6011)	181.1 (55.3,294.9)	3032 (1874,5078)	92.8 (57.7,154.7)	-48.7 (-74.8,43.8)
Liberia	15491 (2917,29207)	308.3 (59.3,580.5)	8785 (5274,13388)	116.4 (70.9,176.9)	-62.2 (-81.1,50.6)
Mali	53133 (21674,93075)	278.2 (110.7,495.9)	76733 (42394,113704)	159.8 (87,240.3)	-42.6 (-70.3,50.4)
Mauritania	4645 (1705,7440)	118.9 (45,192.3)	4484 (2330,7625)	71.3 (37.2,122.3)	-40 (-69.6,54.5)
Niger	33492 (7364,61835)	175.6 (38,334.8)	46661 (25083,70600)	87.5 (47.3,133.3)	-50.2 (-74.6,58.7)
Nigeria	300187 (85930,484589)	167.4 (48,273)	613670 (325150,894372)	161.4 (86.8,234.6)	-3.6 (-32.1,104)
Sao Tome and Principe	326 (133,494)	154.3 (64,233.8)	121 (46,235)	53.2 (20.5,102.6)	-65.5 (-88.7,29.5)
Senegal	22931 (7875,35490)	147.9 (51.9,230.1)	18751 (9978,33690)	84.2 (44.6,151.1)	-43.1 (-75.1,68.4)
Sierra Leone	25223 (5616,47324)	283.9 (63.9,531.6)	22050 (12983,31996)	159.5 (94.6,230)	-43.8 (-69.7,87.8)
Togo	9865 (4140,14426)	136.3 (58.3,199.3)	9857 (6323,16092)	87.7 (55.8,142.7)	-35.7 (-63.5,40.1)
Republic of Coate d'Ivoire	40099 (13835,61791)	160.6 (57.4,246.4)	53630 (35051,77862)	122.7 (80.6,177.7)	-23.6 (-53.1,81)
Republic of Cabo Verde	697 (371,1046)	118.5 (64.6,178)	174 (62,350)	44.1 (15.9,88.2)	-62.7 (-87.3,-9.9)
Republic of the Gambia	2145 (938,3253)	107.4 (47.9,163.5)	2549 (1509,4350)	72.6 (42.9,124.7)	-32.4 (-65.4,54.5)

95% UI=95% uncertainty intervals.

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