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Supplementary appendix

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Global, regional, and national minimum estimates of children affected by COVID-19-associated orphanhood and caregiver death, by age and family circumstance up to Oct 31, 2021: an updated modelling study Supplementary Material

Contents

1 Methods

1.1 Data Sources

The sources of data and the time period they covered are included in Table S1. When age-sex disaggregated COVID-19 death data was not available through October 31, 2021, we updated to that date using Johns Hopkins data [1] as in Hillis et al. [2]. We chose these countries for our study because they accounted for nearly 77% of deaths in our original study.

Since the end of that study, official COVID-19 associated death reports for Peru have been updated to levels similar to previously reported excess death numbers. We therefore remove the excess death adjustment factor for Peru that was previously used. Anand et al. [3] present three different methods for calculating excess deaths through June 30, 2021 in India. We update our excess death adjustment factor for India using their second method based on seroprevalence and infection fatality ratios. Additionally, we now also include excess death estimates for Poland [4].

Table S1: Data sources and dates of age-sex-disaggregated data. PNAD is the National Household Sample Survey for Brazil, DHS is the Demographic Health Survey, ONS is the Office for National Statistics, UNWPP is the United Nations World Population Prospects and UNSD is the United Nations Statistics division.

Country	COVID-19 death source and date	Excess death source and date	COVID-19 / excess deaths adjustment factor	Female fertility source	Male fertility
Argentina	Oct 27 2021 [5]	-	No	Colombia	Colombia
Brazil	Oct 25 2021 [6]	-	Yes	PNAD [7]	PNAD [7]
Colombia	Jul 30 2021 [8]	-	Yes	DHS [9]	DHS [9]
England & Wales	Week 42 2021 [10]	Week 42 2021 [10]	No	ONS [11]	ONS [11]
France	Oct 27 2021 [12]	Week 43 2021 [4]	No	UNWPP [13]	UNSD [14]
Germany	Oct 27 2021 [15]	-	No	UNWPP [13]	UNSD [14]
India	Oct 31 2021 [16]	-	Yes	DHS [9]	DHS [9]
Iran (Islamic Republic of)	Apr 15 2020 [17]	-	Yes	UNWPP [13]	-
Italy	Oct 27 2021 [18]	Week 43 2021 [4]	No	UNWPP [13]	UNSD [14]
Kenya	Jul 27 2020 [19]	-	No	DHS [9]	DHS [9]
Malawi	Aug 3 2021 [20]	-	No	DHS [9]	DHS [9]
Mexico	Oct 27 2021 [21]	-	Yes	UNWPP [13]	UNSD [14]
Nigeria	Oct 31 2021 [22]	-	No	DHS [9]	DHS [9]
Peru	Oct 31 2021 [23]	-	No	DHS [9]	DHS [9]
Philippines	Oct 31 2021 [24]	-	No	UNWPP [13]	UNSD [14]
Poland	Oct 9 2021 [25]	Week 43 2021 [4]	No	UNWPP [13]	UNSD [14]
Russian Federation	-	Sep 2021 [26]	No	UNWPP [13]	UNSD [14]
South Africa	Oct 31 2021 [27]	-	Yes	DHS [9]	DHS [9]
Spain	Oct 27 2021 [28]	Week 43 2021 [4]	No	UNWPP [13]	UNSD [14]
USA	Oct 27 2021 [29]	Week 43 2021 [30]	No	UNWPP [13]	UNSD [14]
Zimbabwe	Mar 31 2021 [31]	-	No	DHS [9]	DHS [9]

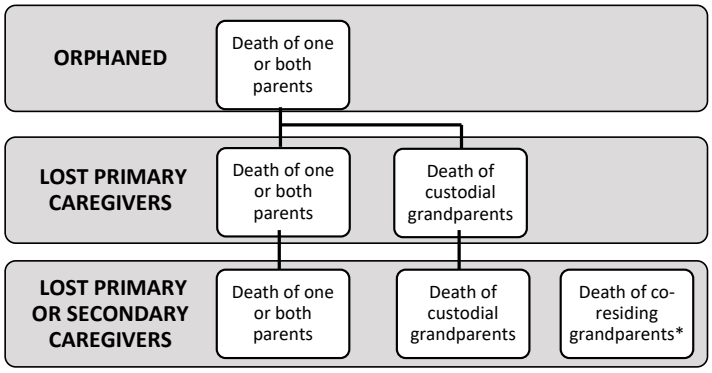

Figure S1: Orphanhood, Loss of Primary Caregivers, Loss of Primary and Secondary Caregivers definitions

We use the new adjustment factor for India and back dated estimates for Peru to update our COVID-19 associated orphanhood and caregiver estimates through March 1, 2020 and April 30, 2021 initially to show the impact that the new data has on previously published findings. We then update the numbers through October 31, 2021. Like in Hillis et al. [2], sex disaggregated data was not available for all age categories in South Africa. We assumed the sex disaggregation in these age groups were consistent with the sex disaggregation we did have data for and did not consider uncertainty.

Figure S1 shows definitions for our categories of caregiver loss and Figure S2 includes a summary of our methods.

1.2 Orphanhood and caregiver loss extrapolation

We updated the extrapolation model in Hillis et al. [2] to include a fixed effect for western Europe after further analysis because the estimates from the original model were consistently high. Our new model has the form:

$$\text{ratio of orphanhood or caregiver loss to deaths } = \frac{\delta e^{\alpha+\beta*\text{TFR}+\gamma*\text{western Europe}}}{1+\delta e^{\alpha+\beta*\text{TFR}+\gamma*\text{western Europe}}} \tag{1}$$

where western Europe is 1 if the country is within western Europe or 0 otherwise and α, β, γ and δ are constants to be fit using least squares.

In spite of secondary household attack rates and infection fatality ratios (IFRs) being potentially raised in the sixth months following the initial study period in Hillis et al. [2] (March 1, 2020 - April 30, 2021) due to the progressively increasing prevalence of the delta variant around the world, the lack of time-varying country-specific population-based data to characterize variant type limited our ability to adjust our analyses for these potential changes. However, the impact of such potential changes would have been minimal since we only used IFRs for Iran and calculation of double orphanhood. Retaining the same IFR estimates we used for our original analysis is further consistent with our chief aim – to model minimum estimates of orphanhood and caregiver loss.

1.2.1 Sources of uncertainty in global and regional totals

Like in Hillis et al. [2], we considered uncertainty from the TFR in our global estimates and do not consider uncertainty in our study countries that we build the model from. We assume our TFR is normally distributed

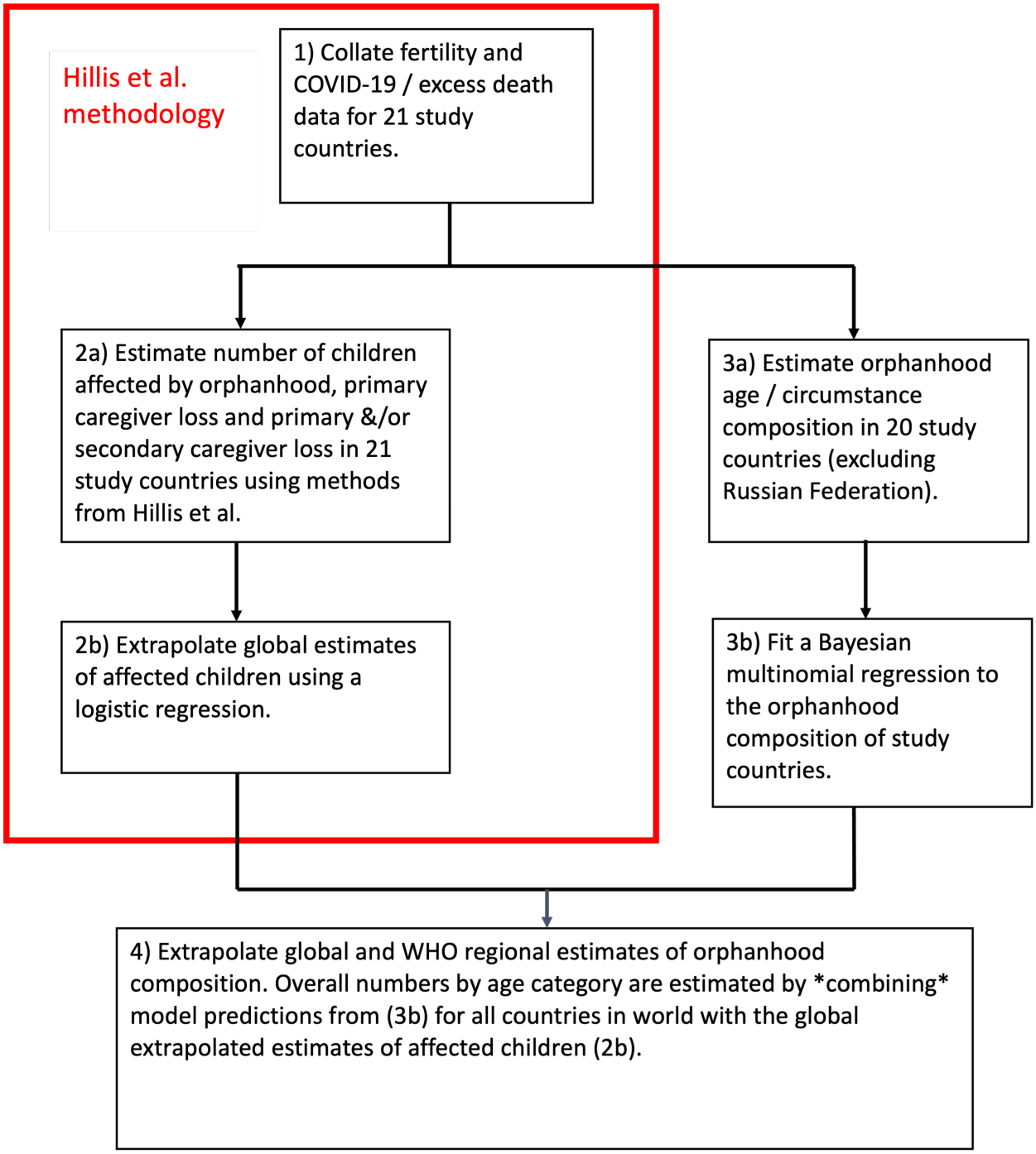

Figure S2: Schematic of methodology.

with the median fertility for 2020-2025 as our mean and estimating the standard deviation from the low and high variants given. We then calculated the global numbers of orphans by sampling the TFR for each country 1000 times and using our previously fitted logistic model. Our central estimates include our country specific estimates from our study, but our 95% credible intervals (CrIs) are based solely on the samples.

A limitation of this approach is that our global and regional totals do not take into account other sources of uncertainty such as in the infection fatality ratio estimates and COVID-19 / excess deaths and it weights each country's observation equally. While our model will sometimes overestimate and sometimes underestimate, we expect these errors to largely cancel out when we aggregate to an overall estimate for the world.

Since the bootstapping samples between our through April 2021 runs and our through October 2021 runs are not linked, care is taken to ensure sensible CrI for our percentage increase in our three categories of orphanhood and caregiver loss (Table 1). First, for each time point, we sort the 1000 global totals into vectors of ascending order. Then we calculate the percentage difference between the sorted vectors and take the 95% credible intervals. The central estimate is from our data without considering uncertainty.

1.3 Double orphan calculation

We use the proportion of double orphans or children who suffer the loss of multiple caregivers in our 21 study countries to estimate the number of global orphans. This is because our study country represents 84.2% of orphans, 84.0% of children who have lost both primary caregiving parents or grandparents and 86.1% of children who have lost both primary caregivers or secondary caregivers.

1.4 Age composition calculation for orphanhood

We adjust the methods in Hillis et al. [2] to estimate the age composition of children who have lost mothers (maternal orphans) and fathers (paternal orphans) for our study countries. We limit this analysis to children whose parents have died due to limited knowledge of elderly population household composition data. We also exclude the Russian Federation as a study country for the remaining analysis because age-sex disaggregation data were not available at the level needed during the pandemic period. We do however include it as a non-study country in our later extrapolations.

Instead of summing the individual contributions to the average number of children an adult of each sex would have between 2003 and 2020, we estimate the yearly fertility contribution separately as that corresponds to the different ages of children. For each country, we considered the expected number of children an adult of age a and sex s would have in year y, which we denote by $F_{a,s,y}$. Again we adjusted the expected births for child mortality based on UN estimates of national survival rates to reach adulthood [32]. We assume a ranges from age 15 to 50 for women and 15 to 80 for men.

The age category-sex-specific numbers of children orphaned of each age were calculated by multiplying the average number of children per age-sex category each year and the number of COVID-19 associated deaths in this category, $D_{a,s}$, according to equation 2:

$$C_{a,s,y}^{\text{orphaned}} = F_{a,s,y} \times D_{a,s}, \tag{2}$$

where a corresponds to the age category of the parent, s to the sex of the parent and y to the year the fertility data was from. The year corresponds directly to the age of the child e.g. a child born in 2003 would be 17 in 2020. Due to incomplete fertility data for 2021, we assume the same fertility pattern for deaths in 2021 as in 2020. We investigate this further in a sensitivity analysis described in Section 1.6.

To obtain the number of children of each age group (year they were born) and sex of parent, we sum over all ages of parents:

$$C_{s,y}^{\text{orphaned}} = \sum_{a \in A} F_{a,s,y} \times D_{a,s}, \tag{3}$$

where A is the set of all ages. We group the age of children into the following categories: 0-4, 5-9 and 10-17, to inform age-and-stage programming for children. We do not adjust for double orphans because the percentage is negligible for the later analyses.

We investigated if the composition of orphanhood varied through time by considering two time periods: i) initial study period (March 1, 2020 - April 30 2021) and ii) following six months (May 1, 2021 - October 31, 2021).

1.4.1 Sources of uncertainty in age composition calculation

Unlike in Hillis et al. [2], we use bootstrapping to include uncertainty intervals around our central estimates of numbers of orphans of each age group for our study countries. We consider uncertainty in our COVID-19 deaths and excess deaths by sampling from a Poisson distribution with mean of the reported deaths. When live births are reported, we consider uncertainty in fertility by sampling from a Poisson distribution with mean of reported births before dividing by the population of adults of the correct sex and age. If only fertility rates were reported, we used the population of adults of the correct sex and age to change the rates to numbers of live births and again sampled from a Poisson distribution. This was the same method used for the fertility rates calculated from Demographic and Health Survey data to ensure reproducibility despite some uncertainty being available through the own child method. We did not consider uncertainty in child mortality as this is small compared to the other sources and assume our population counts used to estimate rates are fixed. Our credible intervals (CrI) are the 95% quantiles of 1000 samples.

1.5 Global extrapolation of ages of children experiencing orphanhood

We used Bayesian multinomial logistic regression to estimate the global, WHO regional, and national composition of orphanhood using the R package brms [33]. We fit a model with the numbers of orphans in our six categories (3 age-categories by type orphanhood) as the outcome variable for our 20 study countries, and the proportion of the total population ages 15-44, 45-64 and 65+ and the most recent per captia gross domestic product (GDP) as the predictor variables:

$$[\text{category / type of orphan}] \sim \text{prop population 15-44} + \text{prop population 45-64} + \text{prop population} > 65 + \text{GDP} \tag{4}$$

We then used this model to predict the age-by-type composition of orphanhood in all countries in the world that have reported COVID-19 deaths according to Johns Hopkins University [1] using Monte Carlo sampling.

For each of our 1000 Monte Carlo samples, we sample 1 draw from our posterior with the sample size for each country set to the country specific estimate of orphanhood predicted from one bootstrap of the model described in Section 1.2 through October 31, 2021. We use the estimated number of orphans from the raw data for all 1000 samples for the Russian Federation.

We then sum these children globally and within the WHO regions to give totals and calculate percentages which we present. We use our study estimates as calculated in Section 1.4 for our 20 study countries and our Monte Carlo samples for all other countries with reported COVID-19 deaths.

1.5.1 Sources of uncertainty in age composition global extrapolation

Uncertainty in the global extrapolation of age composition combines the uncertainty in the estimates of orphanhood in Section 1.2 with the uncertainty from the multinomial regression described above. This only takes into account underlying uncertainty in fertility and not COVID-19 / excess deaths since reporting rates are unknown and will have a larger impact than uncertainty in deaths.

1.6 Fertility rate sensitivity analysis

It is unlikely that fertility rates have remained constant during the pandemic. However, little evidence exists yet to quantify these changes. Aassve et al. [34] suggest significant drops in crude birth rates, in particular in southern Europe. We therefore investigate the impact of a decreased fertility rate on our orphanhood estimates. We note changes in fertility rate during 2021 will only reduce orphans who are under one year old.

In our analysis, we investigate the impact of reducing fertility in 2021 by 20% on the total number of orphans globally. We assume that 20% of children 0-4 were under one and half the children were orphaned in 2020 and half in 2021. We then reduce this number of orphans by 20% and compare it to our original value.

2 Results

2.1 Orphanhood and caregiver loss

Figure S3 shows model fits for our updated model. The mean absolute error (MAE) between the observed orphanhood estimates from our 21 study countries and the predicted values has decreased from 24,566 orphans to 21,181 between the model in Hillis et al. [2] and new model for the initial study period (March 1, 2020 - April 30, 2021). This is similar to the MAE for the primary caregiver loss and primary and/or secondary caregiver loss. The mean leave out out MAE between the full orphanhood model and models with each of the study countries removed also decreases between the old model (24,570 orphans) to the new model (21,037 orphans). This is again similar for the caregiver loss to deaths and primary and/or secondary caregiver loss models.

2.2 Double orphans

We find that global 0.123% of children who experience primary &/or secondary caregiver loss suffer the loss of two caregivers (6,400 [4,400 - 7,200] from 5,200,300 [3,619,400 - 5,731,400]), 0.031% of children who experience primary caregiver loss lose two caregivers (1,100 [700 - 1,300] from 3,550,000 [2,377,700 - 4,280,900]) and 0.012% of orphans experience double orphanhood (400 [200 - 600] from 3,367,000 [2,166,400 - 3,940,500]).

2.3 Study country specific increases in affected children

We show our study country specific increases in affected children in Table S2.

2.3.1 Regional totals of orphanhood and caregiver loss

Table S3 shows the number of children affected by orphanhood, loss of primary caregiver and loss of primary and/or secondary caregiver for the WHO regions through October 31, 2021 and Table S4 shows the percentage increases between April 30, 2021 and October 31, 2021.

2.4 Composition of orphanhood

2.4.1 Study country data

Table S5 shows the composition of orphanhood for our 20 study countries through October 31, 2021.

Calculations of estimated orphanhood cases/1000 children showed highest rates in Peru and South Africa with 8.28/1000 [95% CrI 8.03 - 8.45] and 7.22/1000 [95% CrI 7.07 – 7.36] respectively (Figure S4A). Paternal orphanhood rates were higher than maternal orphanhood rates in all countries, with highest rates of paternal orphanhood in Peru, South Africa, India, and Mexico – all having rates above 3/1000 children (Figure S4B). Among children experiencing maternal orphanhood, the higher rate in South Africa is consistent with high levels of deaths among females, not seen in other study countries. Age-group 10-17 showed highest rates of orphanhood, ranging from approximately 5/1000 to 10/1000 children in Peru, South Africa, Mexico, India, and Colombia; age-group 5-9 had highest rates in Peru, South Africa, and Mexico; and ages 0-4, in South Africa and Peru (Figure S4C).

2.4.2 Global extrapolation

Figure S5 shows our observed versus predicted numbers of children for the 3 age categories and 2 circumstances (maternal or paternal). In this section we include further results about orphanhood composition at our three levels: global, WHO regional and country specific.

2.4.3 Regional totals

Table S6 shows the global and regional composition of orphanhood.

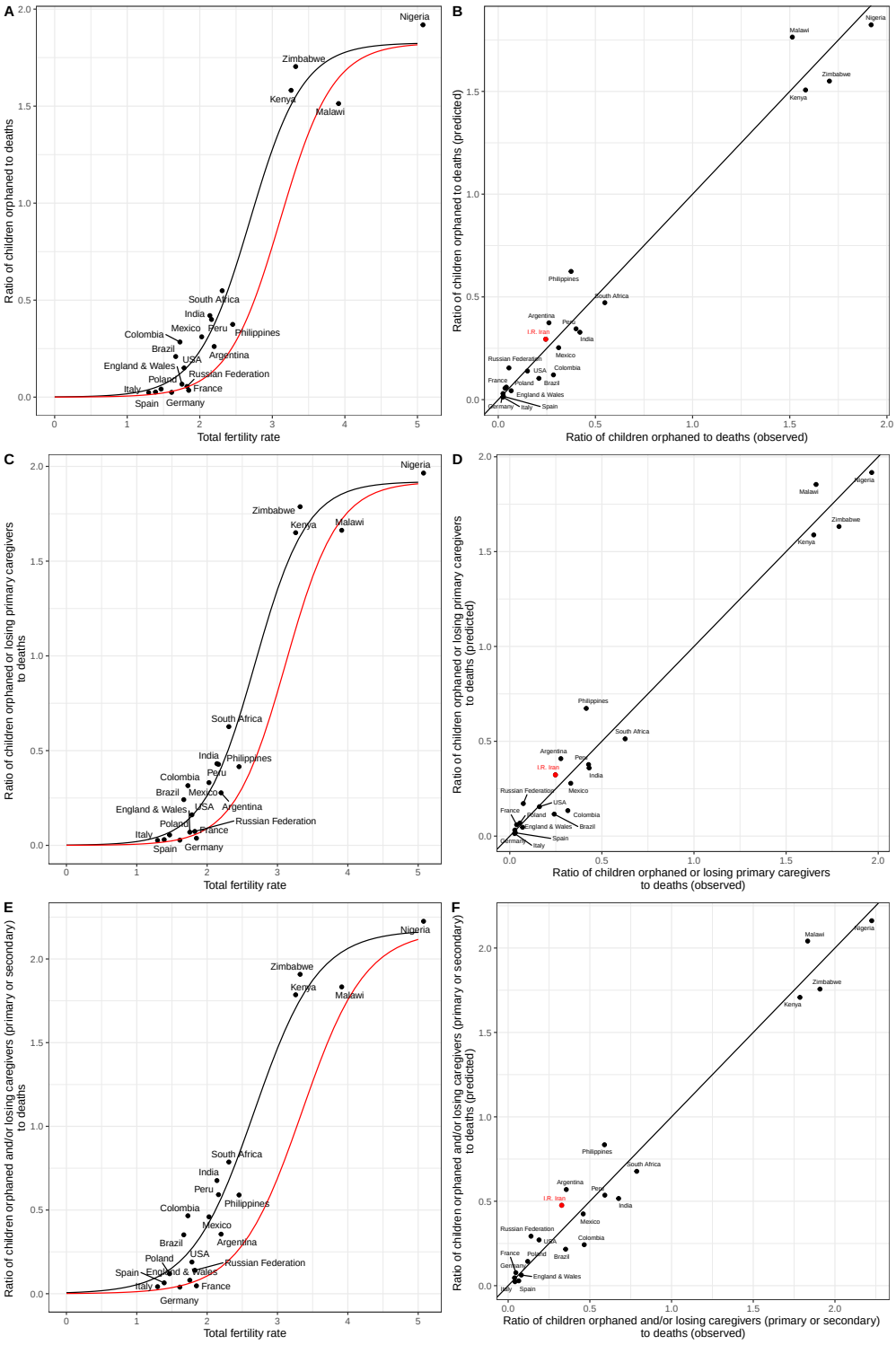

Figure S3: Global orphanhood extrapolation fit for three categories of affected children: orphanhood, loss of primary caregivers and loss of primary and/or secondary caregivers. Figures A, C and E show model fits where the black line shows the fit for non-western European countries and the red line shows the fit for western European countries. Figures B, D and F show observed ratios against predicted ratios for our new model and the Islamic Republic of Iran is shown in red since we do not include this in the model.

Table S2: Country specific increases in affected children between initial study period (March 1, 2020 - April 30, 2021) and subsequent six months (May 1, 2021 - October 31, 2021). Excess death data was not used for countries denoted with a ⋆.

	Study period: March 1, 2020 - April 30, 2021			Update period: May 1, 2021 - October 31, 2021			Percent increase		
Country	Orphanhood	Primary	Primary and or secondary	Orphanhood	Primary	Primary and or secondary	Orphanhood	Primary	Primary and or secondary
Argentina⋆	13,000	14,100	19,500	17,300	18,000	21,700	132.8%	127.7%	111.5%
Brazil	113,200	130,400	189,900	56,700	65,500	95,600	50.1%	50.2%	50.4%
Colombia	29,900	33,300	50,100	25,400	28,000	40,400	85.1%	84.0%	80.8%
England & Wales	8,500	8,900	10,400	1,900	2,000	2,100	22.8%	22.2%	20.5%
France	4,100	4,400	5,500	1,200	1,300	1,600	30.4%	29.9%	28.6%
Germany⋆	1,600	1,800	2,800	800	800	1,000	48.6%	44.4%	35.1%
India	885,000	907,200	1,423,300	1,030,400	1,056,100	1,657,000	116.4%	116.4%	116.5%
I.R. Iran	40,400	41,000	54,200	30,700	31,200	41,200	76%	76%	76.1%
Italy	3,200	3,600	5,800	600	600	900	18.2%	17.6%	16.4%
Kenya⋆	4,300	4,500	4,900	4,000	4,200	4,600	93.7%	93.6%	93.8%
Malawi⋆	2,200	2,400	2,500	1,200	1,500	1,700	55.9%	61.6%	66.6%
Mexico⋆	131,300	141,100	203,500	61,200	63,800	80,800	46.6%	45.2%	39.8%
Nigeria⋆	3,900	3,900	4,500	1,700	1,700	2,000	44.3%	44.2%	43.7%
Peru⋆	68,200	72,900	100,500	11,900	12,800	18,000	17.5%	17.6%	17.9%
Philippines⋆	6,500	7,200	10,400	9,800	10,900	15,300	151.1%	150.2%	146.9%
Poland	3,200	4,100	8,600	3,400	4,500	10,200	107.3%	110.9%	118.1%
Russian Federation	22,300	29,700	56,500	14,500	19,400	36,900	65.2%	65.2%	65.3%
South Africa	82,400	94,600	119,200	52,000	58,900	73,700	63.1%	62.2%	61.8%
Spain	2,300	2,700	6,000	500	500	900	21.6%	20.2%	15.5%
USA	104,900	113,700	136,700	44,400	46,300	51,100	42.4%	40.7%	37.4%
Zimbabwe⋆	2,700	2,800	3,000	5,300	5,600	5,900	198.8%	198.7%	198.8%
Study total	1,533,000	1,624,200	2,417,900	1,375,100	1,433,800	2,162,600	89.7%	88.2%	89.5%

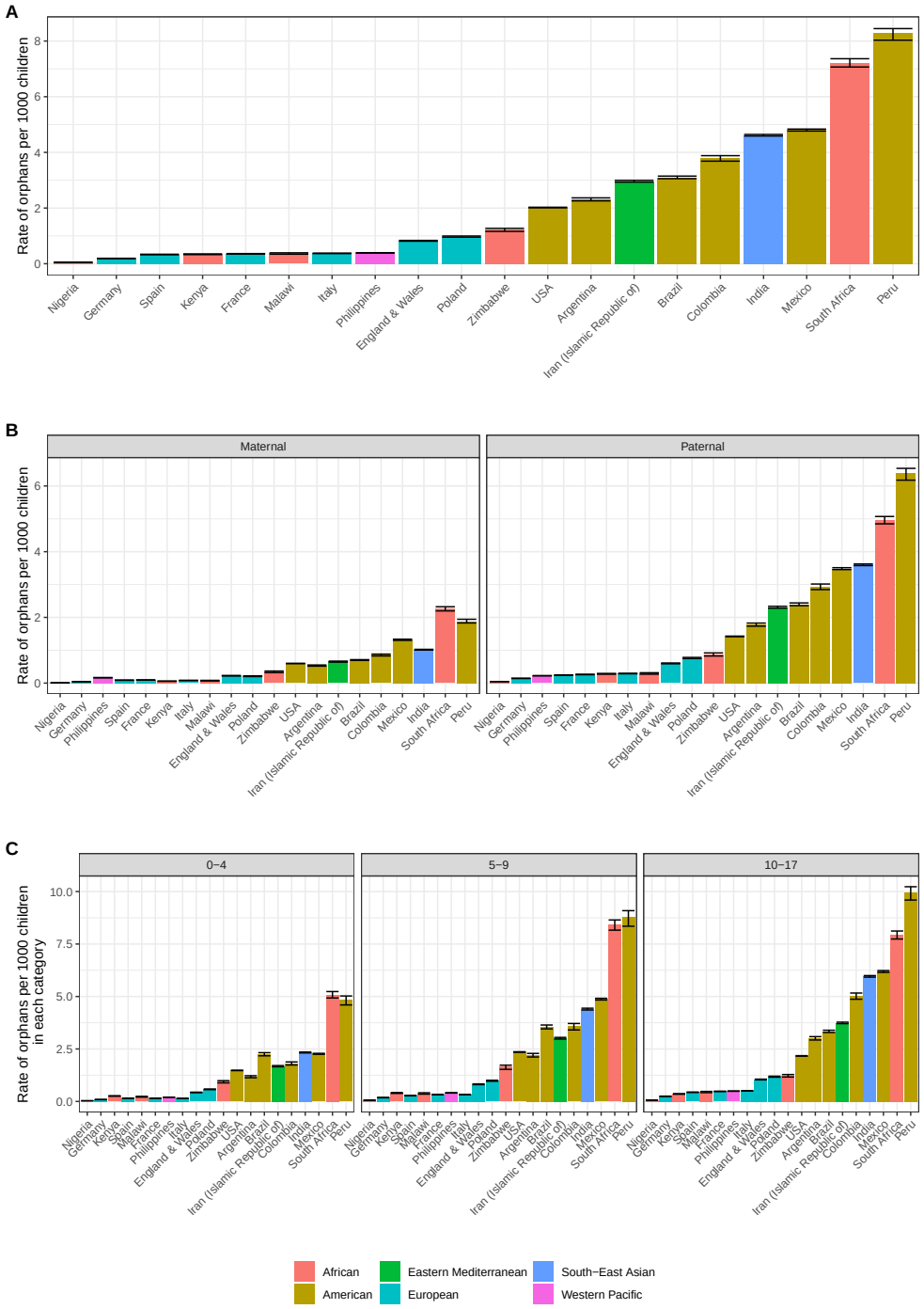

Figure S4: Rates of orphanhood per 1000 for our 20 study countries. Figure A show overall rates of orphanhood per 1000 children ranked in ascending order of rate. Figure B shows maternal and paternal rates of orphanhood per 1000 children ranked in ascending order of paternal orphanhood rate. Figure C shows rates of orphanhood in our 3 age categories (pre-school (0-4), primary school (5-9) and adolescents (10-17)) ranked in ascending order of adolescent orphanhood rate. Black error bars show 95% CrIs. We use COVID attributed deaths only for Argentina, Germany, Kenya, Malawi, Nigeria, Philippines, Peru and Zimbabwe.

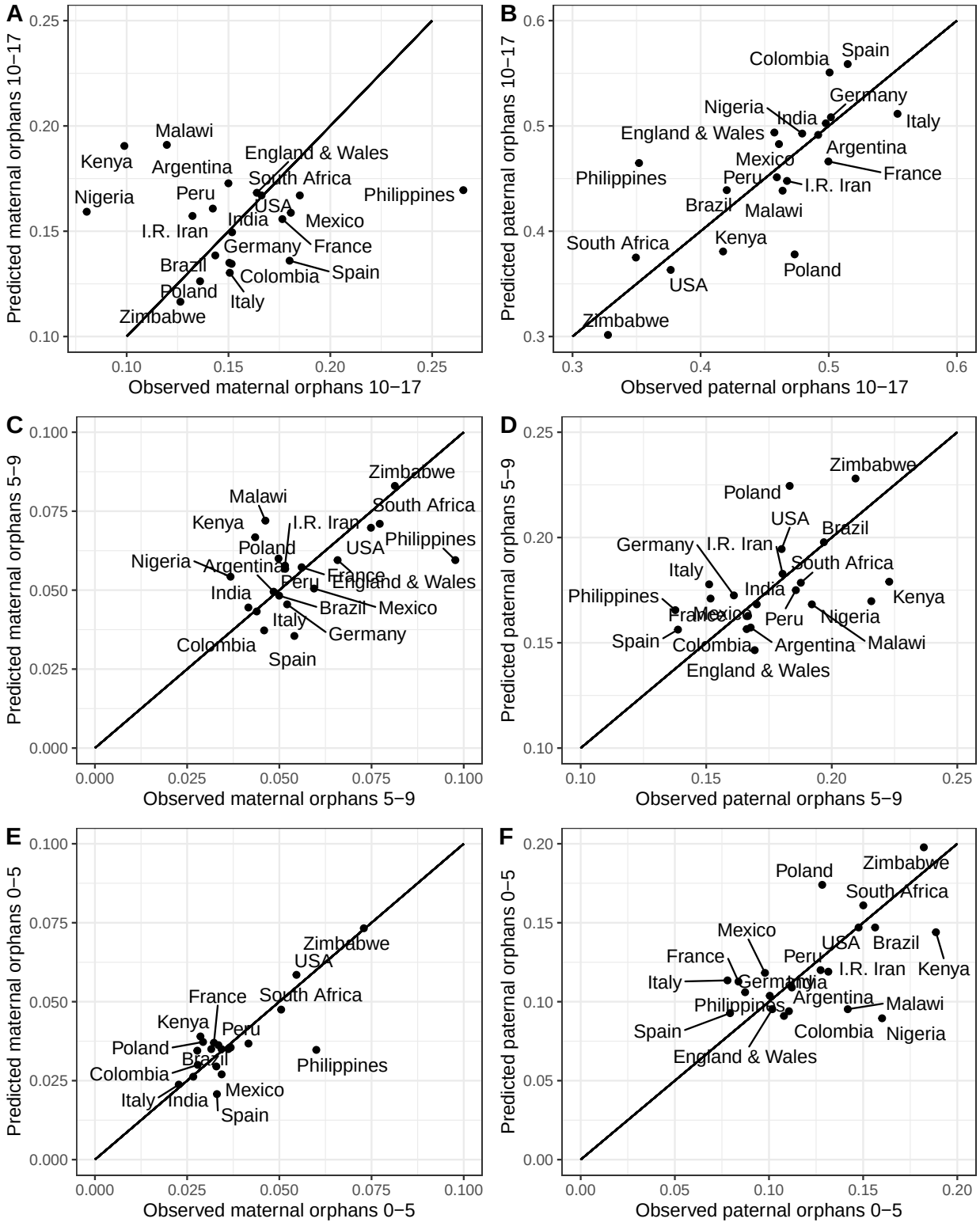

Figure S5: Composition of orphanhood fit. Figures A, C and D show maternal orphans and B, E and F show paternal orphans.

Table S3: Regional numbers of affected children. The square brackets show the 95% CrI.

Region	Orphanhood	Primary caregiver loss	Primary &/or secondary caregiver loss
African	231,600 [229,300 - 233,500]	255,700 [253,400 - 257,800]	305,900 [303,600 - 307,900]
Americas	752,800 [742,400 - 766,600]	821,800 [810,700 - 836,200]	1,116,800 [1,105,100 - 1,131,500]
Eastern Mediterranean	244,800 [234,200 - 254,500]	256,300 [245,200 - 266,300]	304,500 [292,700 - 315,000]
European	114,100 [109,000 - 125,100]	134,300 [128,800 - 146,300]	221,700 [214,200 - 235,800]
South-East Asia	1,989,900 [1,967,300 - 2,026,200]	2,044,800 [2,020,500 - 2,083,000]	3,196,700 [3,169,100 - 3,234,000]
Western Pacific	33,700 [29,700 - 39,700]	37,200 [32,700 - 43,700]	54,700 [49,100 - 62,300]

Table S4: Regional percentage increase of affected children between April 30 2021 and October 31, 2021. The square brackets show the 95% CrI.

Region	Orphanhood	Primary caregiver loss	Primary &/or secondary caregiver loss
African	78.3% [78.1% - 78.4%]	77.4 [77.2% - 77.5%]	76.1 [75.9% - 76.2%]
Americas	50.1% [49.7% - 50.3%]	49.3 [49.0% - 49.6%]	46.7 [46.5% - 46.9%]
Eastern Mediterranean	58.1% [57.5% - 59.0%]	58.4 [57.8% - 59.1%]	59.4 [59.0% - 59.8%]
European	58.1% [57.5% - 59.3%]	58.0 [57.5% - 59.0%]	56.7 [56.2% - 57.1%]
South-East Asia	119.8% [118.9% - 121.1%]	119.9 [119.0% - 121.4%]	119.6 [118.9% - 120.4%]
Western Pacific	309.0% [278.0% - 347.7%]	306.1 [275.8% - 343.1%]	296.1 [274.9% - 317.9%]

2.4.4 Country specific totals and orphanhood composition

Table S7 shows the country specific orphanhood totals and the percentages of orphans in each category.

Table S5: Composition of orphanhood for our 20 study countries. The square brackets show the 95% CrI.

Region	Maternal 0-4	Paternal 0-4	Maternal 5-9	Paternal 5-9	Maternal 10-17	Paternal 10-17
Argentina	3.2% [3.0% - 3.4%]	11.1% [10.5% - 11.6%]	4.8% [4.6% - 5.1%]	16.8% [16.1% - 17.4%]	15.0% [14.5% - 15.5%]	49.2% [48.3% - 50.0%]
Brazil	3.3% [3.2% - 3.4%]	15.6% [15.0% - 16.2%]	5.0% [4.8% - 5.2%]	19.7% [19.2% - 20.2%]	14.4% [14.1% - 14.7%]	42.0% [41.4% - 42.6%]
Colombia	2.8% [2.6% - 3.0%]	10.8% [10.2% - 11.3%]	4.6% [4.3% - 4.9%]	16.6% [16.0% - 17.2%]	15.2% [14.7% - 15.7%]	50.1% [49.1% - 51.0%]
England & Wales	4.2% [3.9% - 4.4%]	10.2% [9.9% - 10.4%]	6.6% [6.3% - 6.9%]	16.9% [16.6% - 17.2%]	16.4% [15.9% - 16.9%]	45.8% [45.1% - 46.3%]
France	3.2% [2.9% - 3.5%]	8.4% [8.0% - 8.7%]	5.6% [5.3% - 6.0%]	15.2% [14.7% - 15.5%]	17.6% [16.8% - 18.4%]	50.0% [49.2% - 50.9%]
Germany	3.4% [3.0% - 3.9%]	10.0% [9.4% - 10.5%]	5.2% [4.7% - 5.7%]	16.1% [15.7% - 16.6%]	15.0% [14.1% - 15.9%]	50.2% [49.2% - 51.4%]
India	2.7% [2.6% - 2.8%]	11.2% [11.1% - 11.4%]	4.2% [4.0% - 4.3%]	17.0% [16.8% - 17.2%]	15.2% [15.0% - 15.4%]	49.8% [49.5% - 50.0%]
Iran (Islamic Republic of)	3.7% [3.5% - 3.9%]	13.2% [12.9% - 13.4%]	5.2% [5.0% - 5.3%]	18.0% [17.8% - 18.2%]	13.2% [12.9% - 13.5%]	46.7% [46.4% - 47.1%]
Italy	2.3% [2.0% - 2.6%]	7.8% [7.5% - 8.1%]	4.4% [4.1% - 4.8%]	15.1% [14.7% - 15.5%]	15.1% [14.3% - 15.7%]	55.4% [54.5% - 56.2%]
Kenya	2.9% [2.5% - 3.2%]	18.9% [18.2% - 19.6%]	4.3% [3.9% - 4.7%]	22.3% [21.6% - 23.0%]	9.9% [9.1% - 10.7%]	41.8% [40.7% - 42.7%]
Malawi	3.6% [3.1% - 4.3%]	14.2% [13.3% - 15.3%]	4.6% [4.0% - 5.3%]	19.2% [18.1% - 20.2%]	12.0% [10.5% - 13.3%]	46.4% [44.6% - 48.1%]
Mexico	3.4% [3.3% - 3.6%]	9.8% [9.7% - 9.9%]	5.9% [5.8% - 6.1%]	16.7% [16.5% - 16.8%]	18.1% [17.8% - 18.3%]	46.1% [45.9% - 46.4%]
Nigeria	2.8% [2.3% - 3.2%]	16.0% [15.5% - 16.5%]	3.7% [3.2% - 4.2%]	21.6% [21.1% - 22.2%]	8.0% [7.1% - 8.9%]	47.9% [46.8% - 48.9%]
Peru	3.3% [3.1% - 3.6%]	12.7% [12.0% - 13.5%]	5.2% [4.9% - 5.4%]	18.6% [17.7% - 19.3%]	14.2% [13.8% - 14.8%]	46.0% [44.9% - 46.9%]
Philippines	6.0% [5.7% - 6.2%]	8.7% [8.5% - 9.0%]	9.8% [9.5% - 10.1%]	13.8% [13.5% - 14.1%]	26.5% [25.9% - 27.1%]	35.2% [34.6% - 35.8%]
Poland	2.9% [2.7% - 3.2%]	12.8% [12.5% - 13.2%]	5.0% [4.7% - 5.3%]	18.3% [18.0% - 18.7%]	13.6% [13.1% - 14.3%]	47.3% [46.6% - 47.9%]
South Africa	5.0% [4.8% - 5.3%]	15.0% [14.5% - 15.5%]	7.7% [7.4% - 8.0%]	18.8% [18.3% - 19.3%]	18.5% [18.0% - 19.0%]	34.9% [34.2% - 35.6%]
Spain	3.3% [3.0% - 3.7%]	7.9% [7.5% - 8.2%]	5.4% [5.0% - 5.8%]	13.9% [13.5% - 14.3%]	18.0% [17.1% - 18.8%]	51.5% [50.7% - 52.6%]
USA	5.5% [5.4% - 5.6%]	14.8% [14.6% - 14.9%]	7.5% [7.4% - 7.6%]	18.0% [17.9% - 18.1%]	16.6% [16.4% - 16.8%]	37.7% [37.5% - 37.8%]
Zimbabwe	7.3% [6.7% - 8.0%]	18.2% [17.2% - 19.3%]	8.1% [7.6% - 8.7%]	20.9% [19.9% - 21.7%]	12.6% [11.8% - 13.6%]	32.8% [31.5% - 34.1%]

Table S6: Global and regional composition of orphanhood. The square brackets show the 95% CrI.

Region	Maternal 0-4	Paternal 0-4	Maternal 5-9	Paternal 5-9	Maternal 10-17	Paternal 10-17
African	4.5% [4.3% - 4.7%]	13.4% [13.0% - 13.7%]	6.8% [6.6% - 7.1%]	18.0% [17.7% - 18.4%]	16.8% [16.5% - 17.2%]	40.4% [39.8% - 40.9%]
Americas	3.8% [3.7% - 3.9%]	12.9% [12.7% - 13.1%]	5.8% [5.7% - 5.9%]	18.0% [17.7% - 18.1%]	16.0% [15.9% - 16.2%]	43.5% [43.3% - 43.8%]
Eastern Mediterranean	3.3% [3.1% - 3.4%]	8.9% [8.6% - 9.2%]	4.9% [4.7% - 5.2%]	14.7% [14.4% - 15.1%]	16.1% [15.7% - 16.4%]	52.1% [51.3% - 52.8%]
European	2.8% [2.6% - 2.9%]	9.7% [9.3% - 10.3%]	4.7% [4.5% - 4.9%]	15.9% [15.4% - 16.3%]	14.8% [14.4% - 15.2%]	52.2% [51.4% - 52.9%]
South-East Asia	2.7% [2.6% - 2.7%]	11.1% [11.0% - 11.3%]	4.1% [4.0% - 4.3%]	16.9% [16.8% - 17.1%]	15.2% [15.0% - 15.4%]	49.9% [49.6% - 50.2%]
Western Pacific	4.5% [4.2% - 4.9%]	9.4% [9.1% - 9.7%]	7.3% [6.8% - 7.7%]	14.8% [14.4% - 15.3%]	21.1% [20.2% - 22.0%]	42.9% [41.6% - 44.2%]
Global	3.1% [3.0% - 3.2%]	11.5% [11.3% - 11.6%]	4.8% [4.7% - 4.9%]	17.0% [16.9% - 17.2%]	15.6% [15.5% - 15.8%]	48.0% [47.8% - 48.2%]

Table S7: Country specific orphanhood numbers and the composition of orphanhood. The square brackets show the 95% CrI.

Country	Total Orphans	Maternal 0-4	Paternal 0-4	Maternal 5-9	Paternal 5-9	Maternal 10-17	Paternal 10-17
African							
Algeria	6,100 [4,200 - 7,800]	2.4% [1.9% - 2.9%]	5.1% [4.4% - 5.7%]	4.4% [3.8% - 5.0%]	11.8% [10.9% - 12.8%]	16.8% [15.6% - 18.0%]	59.5% [58.1% - 60.9%]
Angola	3,100 [3,100 - 3,200]	2.9% [2.2% - 3.6%]	4.6% [3.8% - 5.4%]	4.6% [3.7% - 5.4%]	12.4% [11.1% - 13.8%]	13.3% [11.9% - 14.9%]	62.2% [60.1% - 64.2%]
Benin	300 [200 - 300]	4.7% [2.3% - 7.6%]	9.1% [5.8% - 13.0%]	6.2% [3.4% - 9.3%]	17.4% [13.1% - 22.0%]	12.6% [8.8% - 16.6%]	50.0% [44.1% - 56.2%]
Botswana	2,200 [1,500 - 2,900]	4.1% [3.2% - 5.0%]	12.5% [11.0% - 14.1%]	6.4% [5.3% - 7.5%]	17.6% [15.9% - 19.3%]	18.2% [16.4% - 20.0%]	41.3% [39.1% - 43.3%]
Burkina Faso	400 [300 - 400]	3.8% [2.0% - 5.9%]	6.3% [4.0% - 8.8%]	6.0% [3.8% - 8.5%]	13.8% [10.2% - 17.2%]	17.7% [13.8% - 21.8%]	52.4% [47.1% - 57.2%]
Burundi	100 [0 - 100]	3.5% [0.0% - 8.7%]	10.2% [4.3% - 17.4%]	5.8% [1.4% - 11.6%]	17.1% [8.6% - 26.1%]	15.0% [7.2% - 23.2%]	48.5% [37.6% - 60.9%]
Cabo Verde	100 [0 - 300]	4.1% [0.9% - 8.2%]	16.4% [9.9% - 23.3%]	6.1% [2.1% - 10.7%]	19.7% [12.6% - 26.9%]	16.2% [9.9% - 23.4%]	37.5% [29.0% - 46.7%]
Cameroon	3,000 [3,000 - 3,100]	4.7% [3.8% - 5.6%]	12.5% [11.1% - 13.8%]	6.6% [5.6% - 7.6%]	19.1% [17.5% - 20.6%]	14.0% [12.6% - 15.5%]	43.2% [41.1% - 45.2%]
Central African Republic	200 [100 - 200]	3.8% [1.1% - 6.7%]	10.3% [6.0% - 15.5%]	5.7% [2.2% - 8.9%]	17.1% [12.1% - 22.1%]	15.0% [9.9% - 20.5%]	48.1% [40.1% - 55.3%]
Chad	300 [300 - 400]	3.6% [1.8% - 5.7%]	7.3% [4.7% - 10.1%]	5.6% [3.1% - 8.5%]	15.3% [11.3% - 19.5%]	14.4% [10.6% - 18.3%]	53.8% [48.2% - 59.2%]
Comoros	300 [200 - 300]	2.9% [1.1% - 5.1%]	12.0% [8.3% - 16.3%]	5.3% [2.6% - 8.2%]	17.2% [12.4% - 22.1%]	20.3% [15.5% - 25.5%]	42.3% [36.4% - 48.3%]
Congo	500 [400 - 500]	3.2% [1.7% - 5.0%]	10.7% [7.7% - 13.7%]	5.7% [3.6% - 8.0%]	17.6% [14.0% - 21.6%]	14.7% [11.2% - 18.2%]	48.0% [43.3% - 53.0%]
Cote d'Ivoire	1,300 [1,200 - 1,300]	4.5% [3.3% - 5.9%]	21.5% [19.0% - 23.9%]	6.9% [5.4% - 8.5%]	21.9% [19.5% - 24.4%]	14.5% [12.6% - 16.7%]	30.7% [28.0% - 33.4%]
Democratic Republic of the Congo	2,000 [1,900 - 2,000]	2.8% [1.9% - 3.7%]	3.2% [2.4% - 4.1%]	4.5% [3.4% - 5.6%]	10.2% [8.8% - 11.7%]	15.0% [13.2% - 16.9%]	64.3% [62.0% - 66.6%]
Equatorial Guinea	300 [200 - 400]	3.6% [1.6% - 5.8%]	8.7% [5.6% - 12.0%]	5.5% [2.9% - 8.1%]	15.7% [11.7% - 19.9%]	16.8% [12.7% - 21.2%]	49.8% [44.5% - 55.6%]
Eritrea	100 [0 - 100]	3.5% [0.0% - 7.8%]	11.5% [5.0% - 19.2%]	5.6% [1.2% - 10.4%]	17.2% [9.0% - 26.6%]	17.7% [10.1% - 26.0%]	44.4% [34.2% - 55.6%]

Eswatini	1,300 [900 - 1,700]	5.6% [4.3% - 7.0%]	13.4% [11.5% - 15.5%]	8.4% [6.8% - 10.1%]	17.6% [15.5% - 19.9%]	20.0% [17.7% - 22.4%]	35.1% [32.3% - 37.8%]
Ethiopia	11,300 [10,800 - 11,600]	3.3% [2.9% - 3.8%]	6.8% [6.2% - 7.3%]	5.1% [4.6% - 5.7%]	14.2% [13.3% - 15.0%]	16.4% [15.5% - 17.3%]	54.2% [53.0% - 55.4%]
Gabon	400 [300 - 500]	4.1% [2.2% - 6.2%]	13.7% [10.2% - 17.3%]	6.3% [4.2% - 8.9%]	18.4% [14.5% - 22.3%]	18.4% [14.7% - 22.1%]	39.2% [34.4% - 44.3%]
Gambia (Republic of The)	600 [600 - 700]	4.5% [2.9% - 6.3%]	12.5% [9.8% - 15.2%]	6.8% [4.9% - 9.1%]	17.8% [14.8% - 21.0%]	18.2% [15.3% - 21.7%]	40.1% [36.1% - 44.0%]
Ghana	2,000 [1,800 - 2,100]	2.7% [1.9% - 3.5%]	4.2% [3.3% - 5.2%]	4.6% [3.6% - 5.7%]	11.1% [9.6% - 12.5%]	17.7% [16.0% - 19.7%]	59.7% [57.3% - 61.9%]
Guinea	700 [600 - 800]	3.8% [2.4% - 5.4%]	10.5% [8.3% - 12.9%]	5.4% [3.7% - 7.2%]	18.0% [15.0% - 21.0%]	12.8% [10.3% - 15.5%]	49.5% [45.6% - 53.4%]
Guinea Bissau	300 [200 - 300]	5.5% [3.1% - 8.7%]	18.0% [13.5% - 22.9%]	7.4% [4.3% - 10.8%]	21.9% [16.5% - 27.0%]	12.7% [8.7% - 17.0%]	34.5% [28.5% - 40.5%]
Kenya*	8,400 [8,000 - 8,700]	2.9% [2.5% - 3.2%]	18.9% [18.2% - 19.6%]	4.3% [3.9% - 4.7%]	22.3% [21.6% - 23.0%]	9.9% [9.1% - 10.7%]	41.8% [40.7% - 42.7%]
Lesotho	800 [600 - 1,000]	4.6% [3.1% - 6.0%]	14.2% [11.9% - 16.6%]	7.3% [5.4% - 9.1%]	18.4% [15.9% - 21.3%]	19.3% [16.4% - 22.1%]	36.2% [32.9% - 39.7%]
Liberia	500 [500 - 600]	4.4% [2.7% - 6.3%]	11.0% [8.2% - 13.8%]	6.4% [4.3% - 8.7%]	18.1% [14.5% - 21.6%]	14.3% [11.2% - 17.5%]	45.8% [41.2% - 50.4%]
Madagascar	1,700 [1,600 - 1,800]	3.4% [2.6% - 4.3%]	7.8% [6.5% - 9.3%]	5.4% [4.2% - 6.6%]	15.0% [13.2% - 16.9%]	16.9% [15.1% - 18.9%]	51.4% [48.9% - 53.8%]
Malawi*	3,500 [3,200 - 3,700]	3.6% [3.1% - 4.3%]	14.2% [13.3% - 15.3%]	4.6% [4.0% - 5.3%]	19.2% [18.1% - 20.2%]	12.0% [10.5% - 13.3%]	46.4% [44.6% - 48.1%]
Mali	1,000 [1,000 - 1,100]	2.7% [1.6% - 3.8%]	3.9% [2.7% - 5.1%]	4.3% [3.1% - 5.7%]	11.4% [9.4% - 13.6%]	13.9% [11.7% - 16.1%]	63.8% [60.7% - 66.9%]
Mauritania	1,400 [1,400 - 1,500]	3.7% [2.7% - 4.8%]	9.4% [7.9% - 10.9%]	5.6% [4.4% - 6.8%]	16.3% [14.2% - 18.2%]	16.7% [14.8% - 18.7%]	48.4% [45.7% - 51.1%]
Mauritius	**	2.1% [0.0% - 16.7%]	11.0% [0.0% - 40.0%]	3.4% [0.0% - 22.3%]	15.7% [0.0% - 50.0%]	13.0% [0.0% - 42.9%]	54.8% [16.6% - 87.5%]
Mozambique	3,500 [3,400 - 3,600]	2.6% [1.9% - 3.2%]	2.9% [2.3% - 3.6%]	4.3% [3.5% - 5.1%]	9.5% [8.4% - 10.6%]	16.4% [14.8% - 18.0%]	64.3% [62.3% - 66.4%]
Namibia	5,100 [4,200 - 5,800]	3.7% [3.1% - 4.3%]	8.5% [7.6% - 9.4%]	5.7% [5.0% - 6.5%]	15.1% [14.0% - 16.2%]	19.2% [17.9% - 20.4%]	47.8% [46.4% - 49.3%]
Niger	400 [300 - 400]	4.0% [2.0% - 6.2%]	10.4% [7.4% - 13.7%]	5.7% [3.3% - 8.3%]	18.9% [14.9% - 23.2%]	11.1% [7.9% - 14.4%]	49.8% [44.7% - 55.1%]

Nigeria⋆	5,500 [5,300 - 5,900]	2.8% [2.3% - 3.2%]		16.0% [15.5% - 16.5%]		3.7% [3.2% - 4.2%]		21.6% [21.1% - 22.2%]		8.0% [7.1% - 8.9%]		47.9% [46.8% - 48.9%]	
Rwanda	2,300 [2,100 - 2,400]	3.4% [2.6% - 4.1%]		6.4% [5.4% - 7.5%]		5.8% [4.8% - 6.9%]		13.2% [11.8% - 14.6%]		20.8% [19.0% - 22.7%]		50.3% [48.2% - 52.5%]	
Sao Tome and Principe	100 [0 - 200]	3.7% [0.0% - 8.0%]		13.2% [7.0% - 20.8%]		5.7% [1.9% - 10.9%]		18.7% [11.2% - 27.0%]		17.2% [9.9% - 25.1%]		41.6% [31.6% - 51.5%]	
Senegal	3,400 [3,300 - 3,500]	3.8% [3.2% - 4.5%]		9.7% [8.6% - 10.8%]		5.8% [5.0% - 6.6%]		16.6% [15.2% - 18.0%]		16.4% [15.1% - 17.8%]		47.6% [45.7% - 49.4%]	
Seychelles	100 [0 - 100]	1.7% [0.0% - 5.8%]		8.9% [1.9% - 17.7%]		2.8% [0.0% - 8.2%]		15.0% [6.1% - 25.0%]		11.8% [4.3% - 20.9%]		59.7% [47.2% - 71.9%]	
Sierra Leone	200 [200 - 300]	3.6% [1.4% - 6.6%]		9.5% [5.6% - 13.6%]		5.5% [2.8% - 8.8%]		17.0% [11.8% - 22.2%]		14.0% [9.4% - 19.2%]		50.3% [43.0% - 57.3%]	
South Africa⋆	134,500 [131,600 - 137,200]	5.0% [4.8% - 5.3%]		15.0% [14.5% - 15.5%]		7.7% [7.4% - 8.0%]		18.8% [18.3% - 19.3%]		18.5% [18.0% - 19.0%]		34.9% [34.2% - 35.6%]	
South Sudan	200 [200 - 300]	3.1% [1.2% - 5.4%]		6.0% [3.3% - 9.2%]		4.6% [2.0% - 7.5%]		13.7% [9.1% - 18.3%]		15.0% [10.8% - 20.0%]		57.6% [51.4% - 64.0%]	
Togo	400 [400 - 500]	3.6% [1.8% - 5.5%]		7.5% [5.1% - 10.2%]		5.6% [3.5% - 7.9%]		15.2% [11.9% - 18.5%]		15.7% [12.3% - 19.2%]		52.4% [47.7% - 57.0%]	
Uganda	5,800 [5,700 - 5,900]	5.1% [4.2% - 6.1%]		14.9% [13.4% - 16.4%]		6.6% [5.6% - 7.7%]		21.4% [19.7% - 23.1%]		11.0% [9.9% - 12.2%]		40.8% [38.8% - 42.9%]	
United Republic of Tanzania	1,300 [1,300 - 1,400]	3.4% [2.4% - 4.5%]		6.5% [5.1% - 8.0%]		5.3% [4.0% - 6.6%]		14.1% [12.2% - 16.2%]		15.5% [13.4% - 17.6%]		55.1% [52.4% - 57.9%]	
Zambia	6,600 [6,500 - 6,700]	4.3% [3.6% - 5.0%]		12.7% [11.6% - 13.8%]		6.5% [5.7% - 7.3%]		19.1% [17.9% - 20.3%]		14.7% [13.6% - 15.7%]		42.7% [41.3% - 44.3%]	
Zimbabwe⋆	8,000 [7,500 - 8,300]	7.3% [6.7% - 8.0%]		18.2% [17.2% - 19.3%]		8.1% [7.6% - 8.7%]		20.9% [19.9% - 21.7%]		12.6% [11.8% - 13.6%]		32.8% [31.5% - 34.1%]	
Americas													
Antigua and Barbuda	⋆⋆	2.0% [0.0% - 10.0%]		8.7% [0.0% - 22.3%]		3.6% [0.0% - 13.7%]		15.2% [0.0% - 31.3%]		13.5% [0.0% - 29.5%]		57.0% [35.7% - 77.8%]	
Argentina⋆	30,300 [29,400 - 30,900]	3.2% [3.0% - 3.4%]		11.1% [10.5% - 11.6%]		4.8% [4.6% - 5.1%]		16.8% [16.1% - 17.4%]		15.0% [14.5% - 15.5%]		49.2% [48.3% - 50.0%]	
Bahamas	100 [0 - 200]	2.7% [0.0% - 6.9%]		9.9% [3.5% - 17.8%]		3.8% [0.0% - 8.9%]		15.8% [7.1% - 25.0%]		14.6% [6.6% - 23.3%]		53.3% [41.8% - 65.2%]	
Barbados	⋆⋆	1.3% [0.0% - 10.0%]		7.4% [0.0% - 23.1%]		2.2% [0.0% - 11.8%]		14.2% [0.0% - 35.3%]		11.3% [0.0% - 30.8%]		63.6% [36.3% - 90.0%]	

Belize	200 [100 - 400]	2.8% [0.6% - 5.6%]	7.6% [3.9% - 12.1%]	4.5% [1.6% - 7.9%]	14.1% [8.8% - 19.1%]	18.4% [12.7% - 25.2%]	52.6% [44.7% - 60.3%]
Bolivia (Plurinational State of)	14,600 [9,300 - 20,000]	4.3% [3.9% - 4.7%]	14.4% [13.7% - 15.1%]	6.4% [5.9% - 6.9%]	18.7% [17.9% - 19.5%]	17.6% [16.9% - 18.3%]	38.7% [37.8% - 39.6%]
Brazil*	169,900 [167,300 - 172,500]	3.3% [3.2% - 3.4%]	15.6% [15.0% - 16.2%]	5.0% [4.8% - 5.2%]	19.7% [19.2% - 20.2%]	14.4% [14.1% - 14.7%]	42.0% [41.4% - 42.6%]
Canada	2,000 [900 - 3,500]	4.3% [3.4% - 5.4%]	15.3% [13.6% - 17.2%]	6.6% [5.4% - 7.9%]	19.3% [17.4% - 21.4%]	14.8% [12.9% - 16.4%]	39.7% [37.3% - 42.1%]
Chile	3,500 [1,600 - 6,500]	2.5% [1.9% - 3.1%]	10.9% [9.7% - 12.1%]	4.0% [3.3% - 4.7%]	17.0% [15.7% - 18.4%]	13.3% [12.1% - 14.5%]	52.4% [50.4% - 54.2%]
Colombia*	55,300 [53,700 - 56,600]	2.8% [2.6% - 3.0%]	10.8% [10.2% - 11.3%]	4.6% [4.3% - 4.9%]	16.6% [16.0% - 17.2%]	15.2% [14.7% - 15.7%]	50.1% [49.1% - 51.0%]
Costa Rica	800 [300 - 1,400]	3.0% [1.7% - 4.4%]	10.7% [8.5% - 13.0%]	4.7% [3.0% - 6.3%]	16.6% [13.9% - 19.5%]	15.1% [12.5% - 17.9%]	50.0% [46.3% - 53.8%]
Cuba	700 [300 - 1,300]	0.7% [0.1% - 1.5%]	2.7% [1.4% - 4.0%]	1.4% [0.5% - 2.6%]	8.5% [6.3% - 10.9%]	9.8% [7.4% - 12.3%]	76.9% [73.5% - 80.5%]
Dominica	**	2.1% [0.0% - 33.4%]	9.1% [0.0% - 50.0%]	4.5% [0.0% - 50.0%]	16.1% [0.0% - 66.7%]	13.2% [0.0% - 60.0%]	55.0% [0.0% - 100.0%]
Dominican Republic	1,700 [900 - 2,800]	2.8% [2.0% - 3.7%]	10.1% [8.6% - 11.7%]	4.3% [3.3% - 5.4%]	16.2% [14.3% - 18.0%]	15.9% [14.0% - 17.7%]	50.5% [48.1% - 53.0%]
Ecuador	16,300 [9,400 - 25,500]	3.7% [3.4% - 4.0%]	13.9% [13.4% - 14.6%]	5.6% [5.2% - 6.0%]	18.6% [17.9% - 19.3%]	16.3% [15.7% - 17.0%]	41.8% [41.0% - 42.7%]
El Salvador	800 [400 - 1,400]	4.6% [3.1% - 6.2%]	14.6% [12.0% - 17.2%]	6.4% [4.6% - 8.2%]	19.1% [16.2% - 22.1%]	15.4% [12.8% - 18.3%]	39.9% [36.3% - 43.4%]
Grenada	**	2.1% [0.0% - 7.2%]	9.5% [1.4% - 19.1%]	4.0% [0.0% - 11.2%]	16.0% [6.2% - 28.9%]	15.0% [4.8% - 26.4%]	53.4% [38.6% - 69.3%]
Guatemala	13,300 [8,800 - 17,800]	3.7% [3.3% - 4.2%]	8.4% [7.8% - 9.0%]	5.9% [5.4% - 6.4%]	14.9% [14.1% - 15.6%]	19.4% [18.5% - 20.2%]	47.8% [46.7% - 48.9%]
Guyana	500 [200 - 800]	2.1% [0.7% - 3.6%]	8.0% [5.6% - 10.8%]	2.9% [1.3% - 4.5%]	14.4% [10.9% - 18.1%]	16.0% [12.4% - 19.6%]	56.6% [51.6% - 61.4%]
Haiti	700 [400 - 900]	4.5% [3.0% - 6.1%]	17.7% [14.8% - 20.7%]	6.5% [4.7% - 8.4%]	20.1% [16.8% - 23.3%]	16.8% [13.9% - 19.8%]	34.3% [30.5% - 38.1%]
Honduras	5,000 [2,900 - 7,800]	3.8% [3.2% - 4.5%]	14.5% [13.5% - 15.6%]	6.0% [5.3% - 6.9%]	18.3% [17.1% - 19.6%]	19.6% [18.3% - 20.9%]	37.6% [36.2% - 39.1%]
Jamaica	400 [200 - 800]	2.2% [0.9% - 3.9%]	11.1% [8.1% - 14.2%]	3.7% [1.9% - 5.9%]	17.1% [13.5% - 21.1%]	14.8% [11.2% - 18.5%]	51.0% [46.1% - 55.7%]

Mexico*	192,500 [191,000 - 194,000]	3.4% [3.3% - 3.6%]	9.8% [9.7% - 9.9%]	5.9% [5.8% - 6.1%]	16.7% [16.5% - 16.8%]	18.1% [17.8% - 18.3%]	46.1% [45.9% - 46.4%]
Nicaragua	100 [0 - 200]	4.7% [0.8% - 9.0%]	19.1% [11.1% - 27.8%]	6.5% [1.8% - 11.9%]	20.3% [12.0% - 29.6%]	16.0% [8.5% - 24.3%]	33.4% [23.8% - 43.8%]
Panama	3,900 [2,200 - 5,900]	3.4% [2.7% - 4.0%]	15.0% [13.7% - 16.2%]	5.3% [4.5% - 6.1%]	19.3% [17.9% - 20.6%]	14.9% [13.7% - 16.0%]	42.2% [40.5% - 43.9%]
Paraguay	8,200 [4,700 - 12,300]	4.3% [3.8% - 4.9%]	21.6% [20.5% - 22.6%]	5.9% [5.3% - 6.6%]	21.8% [20.8% - 22.9%]	13.2% [12.3% - 14.0%]	33.1% [31.9% - 34.3%]
Peru*	80,200 [77,700 - 81,800]	3.3% [3.1% - 3.6%]	12.7% [12.0% - 13.5%]	5.2% [4.9% - 5.4%]	18.6% [17.7% - 19.3%]	14.2% [13.8% - 14.8%]	46.0% [44.9% - 46.9%]
Saint Kitts and Nevis	**	1.5% [0.0% - 33.4%]	5.6% [0.0% - 100.0%]	2.6% [0.0% - 50.0%]	13.6% [0.0% - 100.0%]	13.8% [0.0% - 100.0%]	62.8% [0.0% - 100.0%]
Saint Lucia	**	2.2% [0.0% - 12.6%]	14.1% [0.0% - 33.4%]	4.4% [0.0% - 20.0%]	19.0% [0.0% - 44.5%]	12.7% [0.0% - 35.8%]	47.6% [19.9% - 77.9%]
Saint Vincent and the Grenadines	**	2.0% [0.0% - 14.3%]	10.8% [0.0% - 33.4%]	3.1% [0.0% - 18.2%]	17.4% [0.0% - 44.5%]	13.3% [0.0% - 40.0%]	53.4% [22.2% - 84.7%]
Suriname	500 [200 - 900]	2.9% [1.5% - 4.5%]	17.7% [14.3% - 21.2%]	4.5% [2.8% - 6.5%]	20.2% [16.9% - 23.9%]	13.7% [10.8% - 16.7%]	40.9% [36.5% - 45.5%]
Trinidad and Tobago	200 [0 - 400]	2.0% [0.0% - 4.5%]	8.0% [4.2% - 12.5%]	3.5% [1.0% - 6.8%]	14.7% [9.3% - 20.2%]	13.5% [8.4% - 19.1%]	58.3% [50.8% - 66.0%]
Uruguay	1,200 [600 - 2,100]	3.8% [2.7% - 5.1%]	14.7% [12.6% - 16.8%]	5.7% [4.4% - 7.2%]	19.4% [17.1% - 21.8%]	14.8% [12.8% - 16.9%]	41.5% [38.3% - 44.6%]
USA*	149,300 [148,500 - 150,200]	5.5% [5.4% - 5.6%]	14.8% [14.6% - 14.9%]	7.5% [7.4% - 7.6%]	18.0% [17.9% - 18.1%]	16.6% [16.4% - 16.8%]	37.7% [37.5% - 37.8%]
Venezuela (Bolivarian Republic of)	1,800 [1,000 - 3,100]	3.1% [2.3% - 4.0%]	10.8% [9.3% - 12.5%]	4.9% [3.8% - 5.9%]	16.8% [15.0% - 18.8%]	15.7% [13.9% - 17.4%]	48.6% [46.2% - 51.0%]
Eastern European							
Belarus	600 [300 - 1,100]	2.2% [1.0% - 3.5%]	10.8% [7.9% - 13.7%]	3.9% [2.2% - 5.8%]	17.3% [14.0% - 20.5%]	12.2% [9.4% - 15.2%]	53.7% [49.0% - 57.9%]
Bulgaria	2,300 [1,000 - 4,200]	3.0% [2.2% - 4.0%]	20.6% [18.5% - 22.8%]	5.2% [4.2% - 6.4%]	22.7% [20.6% - 24.8%]	11.2% [9.6% - 12.8%]	37.2% [34.8% - 39.8%]
Czech Republic	3,400 [1,700 - 6,300]	4.0% [3.1% - 4.9%]	20.6% [18.9% - 22.4%]	6.6% [5.5% - 7.7%]	22.2% [20.3% - 23.9%]	12.5% [11.1% - 13.8%]	34.2% [32.0% - 36.1%]
Hungary	2,400 [1,100 - 4,500]	3.6% [2.8% - 4.5%]	16.8% [15.1% - 18.5%]	5.8% [4.7% - 6.9%]	21.0% [19.2% - 23.0%]	12.8% [11.3% - 14.5%]	40.0% [37.6% - 42.2%]

Poland*	6,500 [6,400 - 6,700]	2.9% [2.7% - 3.2%]	12.8% [12.5% - 13.2%]	5.0% [4.7% - 5.3%]	18.3% [18.0% - 18.7%]	13.6% [13.1% - 14.3%]	47.3% [46.6% - 47.9%]
Republic of Moldova	300 [100 - 700]	2.2% [0.7% - 4.0%]	8.9% [5.8% - 12.4%]	4.1% [1.8% - 6.7%]	15.8% [11.9% - 20.3%]	14.3% [10.2% - 18.2%]	54.6% [48.6% - 60.6%]
Romania	5,000 [2,500 - 8,900]	2.9% [2.4% - 3.5%]	15.0% [13.8% - 16.2%]	4.7% [4.0% - 5.5%]	19.9% [18.6% - 21.3%]	12.3% [11.1% - 13.3%]	45.2% [43.7% - 46.8%]
Russian Federation	36,800 [36,800 - 36,900]	1.8% [1.6% - 2.0%]	6.5% [6.1% - 6.9%]	3.3% [3.1% - 3.6%]	13.5% [12.9% - 14.1%]	13.5% [12.9% - 14.1%]	61.4% [60.6% - 62.1%]
Slovakia	1,100 [500 - 1,900]	3.0% [1.8% - 4.3%]	12.8% [10.6% - 15.1%]	4.9% [3.6% - 6.4%]	18.5% [15.9% - 21.0%]	13.4% [11.0% - 15.6%]	47.4% [43.9% - 50.9%]
Ukraine	4,300 [2,100 - 7,900]	2.3% [1.7% - 2.8%]	10.2% [9.2% - 11.4%]	4.1% [3.4% - 4.9%]	17.1% [15.7% - 18.5%]	12.6% [11.4% - 13.9%]	53.7% [51.8% - 55.5%]
Eastern Mediterranean							
Afghanistan	12,700 [12,200 - 13,100]	4.9% [4.4% - 5.5%]	13.0% [12.2% - 13.8%]	6.8% [6.1% - 7.4%]	19.2% [18.3% - 20.2%]	13.9% [13.1% - 14.8%]	42.2% [41.0% - 43.4%]
Bahrain	300 [100 - 500]	6.5% [3.5% - 9.8%]	20.0% [14.7% - 25.5%]	7.7% [4.3% - 11.6%]	19.2% [14.5% - 24.2%]	15.9% [11.4% - 21.1%]	30.6% [24.8% - 36.3%]
Djibouti	100 [0 - 200]	6.1% [2.2% - 10.8%]	19.4% [13.2% - 26.4%]	7.8% [3.2% - 13.2%]	20.7% [13.3% - 28.6%]	15.7% [9.5% - 22.4%]	30.2% [22.1% - 38.6%]
Egypt	25,900 [21,100 - 29,400]	2.2% [1.8% - 2.7%]	2.3% [1.9% - 2.6%]	3.4% [2.9% - 3.9%]	8.0% [7.2% - 8.8%]	15.1% [13.8% - 16.3%]	69.1% [67.3% - 70.6%]
I.R. Iran*	71,200 [70,300 - 72,000]	3.7% [3.5% - 3.9%]	13.2% [12.9% - 13.4%]	5.2% [5.0% - 5.3%]	18.0% [17.8% - 18.2%]	13.2% [12.9% - 13.5%]	46.7% [46.4% - 47.1%]
Iraq	37,300 [33,300 - 39,700]	2.7% [2.5% - 3.1%]	5.8% [5.4% - 6.1%]	4.7% [4.4% - 5.1%]	12.4% [11.9% - 13.0%]	20.0% [19.3% - 20.8%]	54.3% [53.5% - 55.2%]
Jordan	8,600 [5,500 - 12,100]	2.8% [2.4% - 3.3%]	6.8% [6.2% - 7.5%]	4.7% [4.1% - 5.3%]	13.3% [12.4% - 14.1%]	19.8% [18.8% - 20.9%]	52.5% [51.2% - 53.8%]
Kuwait	600 [300 - 1,100]	10.3% [7.7% - 13.0%]	21.6% [18.1% - 25.1%]	12.0% [9.2% - 14.8%]	18.7% [15.4% - 21.9%]	15.4% [12.3% - 18.6%]	22.0% [18.5% - 25.5%]
Lebanon	2,200 [1,100 - 3,700]	2.5% [1.8% - 3.3%]	14.0% [12.4% - 15.6%]	4.2% [3.2% - 5.1%]	18.3% [16.5% - 20.0%]	15.0% [13.2% - 16.7%]	46.0% [43.7% - 48.2%]
Libya	1,700 [900 - 2,700]	1.7% [1.1% - 2.5%]	2.5% [1.6% - 3.3%]	3.3% [2.4% - 4.4%]	8.1% [6.7% - 9.6%]	17.3% [15.3% - 19.4%]	67.0% [64.4% - 69.6%]
Morocco	6,900 [3,900 - 10,900]	2.4% [2.0% - 2.8%]	8.8% [8.1% - 9.6%]	4.0% [3.4% - 4.5%]	15.3% [14.4% - 16.3%]	15.6% [14.6% - 16.5%]	54.0% [52.7% - 55.3%]

Occupied Palestinian Territory	7,800 [7,100 - 8,200]	3.8% [3.2% - 4.4%]	12.8% [11.8% - 13.8%]	6.6% [5.8% - 7.4%]	17.9% [16.8% - 19.1%]	19.6% [18.4% - 20.9%]	39.3% [37.8% - 40.7%]
Oman	3,300 [2,000 - 4,600]	8.9% [7.5% - 10.5%]	10.9% [9.6% - 12.3%]	11.1% [9.6% - 12.6%]	15.7% [14.2% - 17.4%]	19.5% [17.7% - 21.3%]	33.9% [31.8% - 36.0%]
Pakistan	42,200 [36,100 - 46,600]	2.9% [2.7% - 3.2%]	7.1% [6.8% - 7.5%]	4.7% [4.5% - 5.1%]	14.2% [13.7% - 14.7%]	17.0% [16.4% - 17.5%]	54.0% [53.2% - 54.7%]
Qatar	100 [0 - 200]	20.8% [11.4% - 31.0%]	36.2% [26.0% - 46.7%]	16.9% [9.2% - 25.6%]	13.1% [5.7% - 21.1%]	8.5% [2.7% - 15.2%]	4.5% [0.0% - 9.6%]
Saudi Arabia	3,200 [1,700 - 5,200]	4.4% [3.6% - 5.2%]	13.7% [12.3% - 15.0%]	6.9% [5.9% - 8.0%]	16.8% [15.2% - 18.3%]	20.6% [19.0% - 22.2%]	37.5% [35.6% - 39.5%]
Somalia	2,200 [2,200 - 2,300]	3.0% [2.2% - 3.9%]	8.4% [7.1% - 9.8%]	4.4% [3.5% - 5.5%]	16.2% [14.5% - 18.0%]	12.4% [11.0% - 14.1%]	55.6% [53.3% - 58.0%]
Sudan	5,600 [5,400 - 5,700]	3.3% [2.8% - 4.0%]	11.7% [10.8% - 12.7%]	5.1% [4.4% - 5.8%]	18.4% [17.1% - 19.6%]	14.6% [13.6% - 15.8%]	46.8% [45.3% - 48.3%]
Syrian Arab Republic	2,200 [1,400 - 3,000]	3.8% [2.9% - 4.8%]	9.3% [8.0% - 10.6%]	5.8% [4.8% - 6.9%]	15.9% [14.3% - 17.5%]	17.2% [15.6% - 19.0%]	47.9% [45.6% - 50.2%]
Tunisia	7,800 [4,200 - 12,500]	1.0% [0.7% - 1.4%]	1.5% [1.2% - 1.9%]	2.1% [1.6% - 2.5%]	6.2% [5.5% - 6.9%]	14.3% [13.1% - 15.7%]	74.8% [73.3% - 76.3%]
United Arab Emirates	100 [0 - 200]	12.3% [5.3% - 19.5%]	42.0% [31.9% - 52.3%]	11.7% [5.5% - 19.0%]	17.4% [10.3% - 25.1%]	8.8% [3.2% - 14.8%]	7.9% [2.9% - 14.1%]
Yemen	3,000 [2,600 - 3,300]	4.4% [3.5% - 5.2%]	10.9% [9.8% - 12.1%]	7.0% [6.1% - 8.0%]	16.4% [15.0% - 17.8%]	21.4% [19.9% - 23.0%]	39.9% [38.0% - 41.9%]
Western European							
Albania	100 [0 - 200]	3.3% [0.0% - 8.2%]	8.5% [2.3% - 15.7%]	4.6% [0.0% - 9.7%]	15.8% [7.4% - 25.6%]	14.5% [6.4% - 23.5%]	53.3% [40.6% - 65.3%]
Andorra	**	0.9% [0.0% - 0.1%]	5.3% [0.0% - 100.0%]	1.8% [0.0% - 0.1%]	14.0% [0.0% - 100.0%]	10.7% [0.0% - 100.0%]	67.3% [0.0% - 100.0%]
Armenia	300 [100 - 600]	2.2% [0.4% - 4.1%]	8.3% [4.9% - 12.0%]	3.7% [1.5% - 6.2%]	15.2% [11.0% - 19.6%]	13.5% [9.5% - 17.7%]	57.1% [51.1% - 63.0%]
Austria	300 [100 - 600]	3.4% [1.4% - 5.9%]	10.6% [6.9% - 14.7%]	5.1% [2.6% - 7.8%]	16.6% [12.3% - 20.7%]	14.0% [10.0% - 18.2%]	50.2% [44.3% - 56.3%]
Azerbaijan	600 [300 - 1,100]	2.2% [1.1% - 3.6%]	12.3% [9.5% - 15.2%]	3.9% [2.4% - 5.8%]	17.6% [14.1% - 21.0%]	13.2% [10.3% - 16.2%]	50.8% [46.5% - 55.0%]
Belgium	1,100 [500 - 2,200]	4.1% [2.9% - 5.5%]	13.0% [10.9% - 15.1%]	6.5% [4.8% - 8.1%]	18.1% [15.6% - 20.5%]	15.4% [13.1% - 17.8%]	42.9% [39.8% - 45.7%]

Bosnia and Herzegovina	100 [0 - 300]	1.5% [0.0% - 4.3%]	8.5% [3.7% - 14.1%]	2.6% [0.0% - 6.0%]	15.2% [9.2% - 22.3%]	10.1% [4.6% - 15.7%]	62.1% [52.6% - 71.5%]
Croatia	200 [0 - 400]	3.3% [0.7% - 6.4%]	16.9% [11.1% - 23.4%]	5.6% [2.1% - 9.3%]	21.1% [14.5% - 28.2%]	12.1% [6.3% - 17.5%]	41.0% [33.3% - 49.7%]
Cyprus	**	4.0% [0.0% - 25.0%]	13.0% [0.0% - 40.0%]	5.5% [0.0% - 28.6%]	18.0% [0.0% - 50.0%]	14.7% [0.0% - 45.6%]	44.9% [0.0% - 83.4%]
Denmark	100 [0 - 300]	5.9% [2.1% - 10.5%]	22.9% [15.8% - 30.5%]	8.0% [3.2% - 13.3%]	21.8% [14.4% - 30.5%]	13.3% [7.3% - 19.2%]	28.2% [20.2% - 37.5%]
England & Wales*	10,400 [10,200 - 10,600]	4.2% [3.9% - 4.4%]	10.2% [9.9% - 10.4%]	6.6% [6.3% - 6.9%]	16.9% [16.6% - 17.2%]	16.4% [15.9% - 16.9%]	45.8% [45.1% - 46.3%]
Estonia	100 [0 - 100]	3.2% [0.0% - 9.6%]	17.8% [7.1% - 29.3%]	6.1% [0.0% - 14.0%]	21.3% [9.9% - 34.0%]	13.0% [3.8% - 24.2%]	38.6% [24.3% - 52.2%]
Finland	**	5.7% [0.0% - 17.7%]	15.5% [0.0% - 33.4%]	9.0% [0.0% - 25.0%]	19.4% [3.8% - 39.2%]	16.4% [0.0% - 33.4%]	33.9% [13.3% - 55.6%]
France*	5,300 [5,100 - 5,500]	3.2% [2.9% - 3.5%]	8.4% [8.0% - 8.7%]	5.6% [5.3% - 6.0%]	15.2% [14.7% - 15.5%]	17.6% [16.8% - 18.4%]	50.0% [49.2% - 50.9%]
Georgia	900 [400 - 1,700]	2.6% [1.5% - 3.7%]	9.1% [7.2% - 11.3%]	4.7% [3.3% - 6.2%]	16.3% [13.7% - 19.0%]	14.0% [11.5% - 16.8%]	53.2% [49.5% - 57.1%]
Germany*	2,400 [2,200 - 2,500]	3.4% [3.0% - 3.9%]	10.0% [9.4% - 10.5%]	5.2% [4.7% - 5.7%]	16.1% [15.7% - 16.6%]	15.0% [14.1% - 15.9%]	50.2% [49.2% - 51.4%]
Greece	200 [0 - 400]	3.1% [0.7% - 6.1%]	17.6% [12.0% - 24.0%]	5.3% [2.0% - 9.1%]	21.6% [15.3% - 28.5%]	12.3% [7.5% - 17.2%]	40.1% [32.9% - 47.6%]
Iceland	**	5.1% [0.0% - 100.0%]	13.4% [0.0% - 100.0%]	7.6% [0.0% - 100.0%]	18.6% [0.0% - 100.0%]	17.2% [0.0% - 100.0%]	38.1% [0.0% - 100.0%]
Ireland	300 [100 - 500]	5.1% [2.5% - 8.2%]	7.8% [4.5% - 11.4%]	7.7% [4.7% - 11.3%]	12.8% [8.5% - 17.4%]	22.9% [17.7% - 28.4%]	43.6% [37.9% - 49.8%]
Israel	5,700 [3,500 - 8,200]	3.6% [2.9% - 4.3%]	5.4% [4.6% - 6.1%]	5.9% [5.2% - 6.7%]	11.5% [10.5% - 12.5%]	22.6% [21.1% - 24.1%]	51.1% [49.5% - 52.8%]
Italy*	3,800 [3,600 - 3,900]	2.3% [2.0% - 2.6%]	7.8% [7.5% - 8.1%]	4.4% [4.1% - 4.8%]	15.1% [14.7% - 15.5%]	15.1% [14.3% - 15.7%]	55.4% [54.5% - 56.2%]
Kazakhstan	6,600 [3,500 - 10,700]	2.4% [1.9% - 2.9%]	8.2% [7.3% - 9.0%]	4.5% [3.9% - 5.1%]	14.7% [13.6% - 15.8%]	16.0% [14.8% - 17.2%]	54.3% [52.7% - 55.8%]
Kosovo	200 [100 - 500]	3.3% [1.0% - 5.9%]	14.9% [10.3% - 19.9%]	5.3% [2.5% - 8.8%]	18.9% [13.7% - 24.6%]	15.8% [11.1% - 20.5%]	41.8% [35.1% - 48.9%]
Kyrgyzstan	1,600 [900 - 2,400]	3.1% [2.1% - 4.0%]	10.5% [8.9% - 12.1%]	5.4% [4.1% - 6.6%]	16.7% [14.8% - 18.7%]	16.2% [14.1% - 18.2%]	48.2% [45.3% - 50.9%]

Latvia	100 [0 - 300]	2.8% [0.0% - 5.9%]	16.9% [10.7% - 23.3%]	4.8% [1.5% - 8.7%]	21.5% [14.7% - 28.6%]	11.0% [6.0% - 16.7%]	43.0% [34.2% - 51.4%]
Liechtenstein	**	10.6% [0.0% - 100.0%]	6.6% [0.0% - 100.0%]	12.5% [0.0% - 100.0%]	10.2% [0.0% - 100.0%]	28.4% [0.0% - 100.0%]	31.7% [0.0% - 100.0%]
Lithuania	200 [100 - 500]	2.3% [0.5% - 4.6%]	9.4% [5.4% - 13.6%]	4.0% [1.4% - 7.1%]	16.6% [11.6% - 21.3%]	12.6% [8.3% - 17.1%]	55.1% [48.5% - 61.7%]
Luxembourg	**	9.7% [0.0% - 27.3%]	14.1% [0.0% - 35.4%]	11.6% [0.0% - 33.4%]	15.0% [0.0% - 33.4%]	20.7% [0.0% - 44.5%]	28.9% [7.1% - 53.4%]
Malta	**	6.1% [0.0% - 25.0%]	17.7% [0.0% - 44.5%]	8.7% [0.0% - 30.0%]	21.3% [0.0% - 50.0%]	13.5% [0.0% - 42.9%]	32.7% [0.0% - 64.8%]
Monaco	**	20.4% [0.0% - 100.0%]	14.7% [0.0% - 100.0%]	22.7% [0.0% - 100.0%]	11.6% [0.0% - 100.0%]	19.2% [0.0% - 100.0%]	11.4% [0.0% - 100.0%]
Montenegro	100 [0 - 200]	2.4% [0.0% - 6.0%]	15.0% [7.7% - 22.3%]	4.1% [0.0% - 9.0%]	20.3% [11.2% - 29.7%]	11.1% [4.8% - 18.5%]	47.0% [35.6% - 58.9%]
Netherlands	700 [300 - 1,400]	3.8% [2.2% - 5.5%]	10.7% [8.2% - 13.5%]	5.6% [3.9% - 7.6%]	16.7% [13.5% - 19.7%]	15.5% [12.4% - 18.4%]	47.8% [43.9% - 51.9%]
North Macedonia	200 [0 - 300]	2.6% [0.0% - 5.7%]	11.9% [6.5% - 17.7%]	4.2% [1.0% - 7.9%]	17.9% [11.3% - 24.7%]	12.5% [6.6% - 18.3%]	51.0% [41.6% - 59.5%]
Norway	**	5.8% [0.0% - 14.7%]	15.4% [3.8% - 29.2%]	8.4% [0.0% - 19.3%]	18.3% [5.5% - 31.9%]	16.9% [4.5% - 30.5%]	35.2% [19.9% - 50.8%]
Portugal	300 [100 - 600]	3.2% [1.2% - 5.7%]	19.6% [14.6% - 24.3%]	5.0% [2.6% - 8.0%]	22.2% [17.2% - 27.5%]	11.4% [7.5% - 15.4%]	38.6% [32.4% - 44.6%]
San Marino	**	2.3% [0.0% - 50.0%]	9.6% [0.0% - 100.0%]	4.3% [0.0% - 50.0%]	15.5% [0.0% - 100.0%]	13.4% [0.0% - 100.0%]	55.0% [0.0% - 100.0%]
Scotland & Northern Ireland	600 [200 - 1,100]	4.1% [2.4% - 6.0%]	12.9% [9.9% - 15.9%]	6.2% [4.2% - 8.5%]	18.3% [14.7% - 21.5%]	14.7% [11.7% - 17.7%]	43.8% [39.2% - 48.6%]
Serbia	200 [0 - 400]	2.5% [0.5% - 5.2%]	10.8% [6.1% - 15.8%]	4.2% [1.2% - 7.7%]	17.6% [12.0% - 23.5%]	12.5% [7.4% - 17.9%]	52.4% [44.7% - 60.1%]
Slovenia	200 [0 - 300]	2.7% [0.3% - 5.9%]	10.1% [5.3% - 15.0%]	5.0% [1.7% - 9.0%]	16.9% [10.7% - 23.3%]	13.7% [8.2% - 19.9%]	51.6% [43.5% - 60.2%]
Spain*	2,800 [2,700 - 2,900]	3.3% [3.0% - 3.7%]	7.9% [7.5% - 8.2%]	5.4% [5.0% - 5.8%]	13.9% [13.5% - 14.3%]	18.0% [17.1% - 18.8%]	51.5% [50.7% - 52.6%]
Sweden	900 [400 - 1,700]	5.9% [4.3% - 7.7%]	15.1% [12.4% - 17.6%]	8.6% [6.7% - 10.7%]	18.9% [16.2% - 21.6%]	16.0% [13.3% - 18.8%]	35.5% [32.0% - 39.1%]
Switzerland	300 [100 - 600]	5.8% [3.0% - 9.0%]	10.6% [7.0% - 14.4%]	7.9% [4.8% - 11.3%]	15.2% [10.6% - 19.9%]	18.5% [13.6% - 23.4%]	41.9% [36.1% - 47.9%]

Tajikistan	200 [100 - 200]	3.4% [0.7% - 6.4%]	9.8% [5.2% - 14.6%]	5.4% [2.2% - 9.3%]	16.0% [10.1% - 22.4%]	17.6% [11.9% - 23.4%]	47.8% [40.2% - 55.6%]
Turkey	6,200 [2,900 - 10,900]	2.7% [2.2% - 3.2%]	11.8% [10.8% - 12.7%]	4.3% [3.7% - 4.9%]	17.2% [16.1% - 18.3%]	15.4% [14.4% - 16.5%]	48.6% [47.2% - 50.0%]
Uzbekistan	300 [100 - 500]	4.2% [1.7% - 7.0%]	16.6% [12.1% - 21.6%]	5.7% [2.5% - 9.1%]	19.8% [14.7% - 24.9%]	14.4% [9.9% - 19.1%]	39.4% [32.8% - 45.8%]
South-East Asian							
Bangladesh	5,900 [2,800 - 10,200]	3.4% [2.9% - 4.0%]	13.8% [12.8% - 14.8%]	5.2% [4.5% - 5.8%]	18.6% [17.4% - 19.7%]	15.7% [14.8% - 16.7%]	43.3% [41.9% - 44.6%]
Bhutan	**	5.3% [0.0% - 100.0%]	24.8% [0.0% - 100.0%]	6.1% [0.0% - 100.0%]	21.6% [0.0% - 100.0%]	16.9% [0.0% - 100.0%]	25.4% [0.0% - 100.0%]
India*	1,917,100 [1,905,000 - 1,928,300]	2.7% [2.6% - 2.8%]	11.2% [11.1% - 11.4%]	4.2% [4.0% - 4.3%]	17.0% [16.8% - 17.2%]	15.2% [15.0% - 15.4%]	49.8% [49.5% - 50.0%]
Indonesia	57,600 [32,900 - 90,200]	2.1% [1.9% - 2.3%]	8.5% [8.2% - 8.8%]	3.6% [3.4% - 3.9%]	14.8% [14.4% - 15.2%]	16.0% [15.6% - 16.5%]	54.9% [54.4% - 55.5%]
Maldives	**	7.1% [0.0% - 17.9%]	21.8% [7.1% - 36.9%]	8.9% [0.0% - 19.4%]	20.4% [7.9% - 34.4%]	14.8% [4.1% - 28.2%]	27.0% [12.9% - 43.5%]
Myanmar	5,400 [2,900 - 9,200]	2.4% [1.9% - 2.9%]	9.0% [8.1% - 9.8%]	4.0% [3.4% - 4.6%]	15.2% [14.1% - 16.3%]	16.2% [15.1% - 17.3%]	53.2% [51.8% - 54.8%]
Nepal	1,700 [800 - 2,900]	3.7% [2.7% - 4.7%]	12.9% [11.1% - 14.8%]	5.6% [4.5% - 6.9%]	17.7% [15.8% - 19.8%]	18.4% [16.3% - 20.4%]	41.7% [39.2% - 44.2%]
Sri Lanka	4,500 [2,400 - 7,500]	2.3% [1.8% - 2.8%]	11.5% [10.3% - 12.6%]	3.9% [3.3% - 4.6%]	17.5% [16.2% - 18.6%]	14.3% [13.2% - 15.5%]	50.5% [49.0% - 52.2%]
Thailand	1,200 [500 - 2,300]	1.5% [0.8% - 2.3%]	9.3% [7.5% - 11.0%]	2.6% [1.6% - 3.6%]	15.8% [13.4% - 18.1%]	11.0% [9.1% - 13.1%]	59.9% [56.8% - 63.0%]
Timor-Leste	200 [100 - 300]	2.3% [0.4% - 4.9%]	4.3% [1.8% - 7.4%]	3.7% [1.4% - 6.3%]	11.5% [7.1% - 16.0%]	15.1% [9.9% - 20.0%]	63.1% [56.1% - 69.9%]
Western Pacific							
Australia	300 [100 - 500]	5.3% [2.4% - 8.4%]	12.7% [8.3% - 17.3%]	7.9% [4.2% - 12.0%]	17.3% [12.4% - 22.6%]	17.7% [12.8% - 23.0%]	39.2% [32.1% - 46.1%]
Brunei Darussalam	**	5.4% [0.0% - 22.3%]	14.3% [0.0% - 40.0%]	6.8% [0.0% - 25.0%]	17.4% [0.0% - 44.5%]	16.5% [0.0% - 40.1%]	39.6% [11.1% - 70.0%]
Cambodia	1,600 [900 - 2,400]	3.9% [2.9% - 4.9%]	13.2% [11.4% - 15.0%]	5.9% [4.7% - 7.2%]	18.2% [16.0% - 20.2%]	16.4% [14.4% - 18.2%]	42.5% [40.0% - 45.1%]

China	600 [200 - 1,100]	1.8% [0.7% - 3.1%]	10.0% [7.5% - 12.8%]	3.0% [1.6% - 4.6%]	16.4% [13.2% - 19.9%]	10.7% [8.1% - 13.5%]	58.1% [53.3% - 62.4%]
Fiji	600 [300 - 800]	3.0% [1.5% - 4.6%]	16.9% [13.5% - 20.5%]	5.1% [3.2% - 6.8%]	20.2% [16.8% - 23.6%]	13.8% [11.0% - 16.7%]	41.1% [37.0% - 45.3%]
Japan	900 [400 - 1,700]	5.7% [3.9% - 7.6%]	14.8% [12.2% - 17.6%]	8.9% [6.7% - 11.2%]	19.7% [16.9% - 22.6%]	15.8% [13.3% - 18.7%]	35.1% [31.5% - 38.5%]
Lao People's Democratic Republic	**	4.1% [0.0% - 11.8%]	13.2% [3.0% - 25.0%]	5.8% [0.0% - 14.3%]	18.2% [5.9% - 30.7%]	17.1% [6.3% - 29.1%]	41.6% [26.6% - 56.8%]
Malaysia	5,900 [3,000 - 10,300]	3.6% [3.0% - 4.2%]	9.7% [8.8% - 10.6%]	5.3% [4.6% - 6.1%]	15.6% [14.5% - 16.8%]	17.9% [16.7% - 19.0%]	48.0% [46.4% - 49.5%]
Mongolia	1,700 [1,100 - 2,200]	2.0% [1.3% - 2.8%]	4.1% [3.1% - 5.2%]	3.8% [2.8% - 4.9%]	10.1% [8.5% - 11.7%]	18.1% [16.0% - 20.2%]	61.9% [59.2% - 64.5%]
New Zealand	**	4.2% [0.0% - 33.4%]	14.7% [0.0% - 60.0%]	6.8% [0.0% - 33.5%]	18.3% [0.0% - 60.0%]	15.7% [0.0% - 60.0%]	40.3% [0.0% - 83.4%]
Papua New Guinea	600 [500 - 700]	3.3% [2.0% - 4.8%]	11.4% [9.0% - 14.0%]	5.1% [3.4% - 7.1%]	17.2% [14.3% - 20.3%]	16.9% [13.9% - 20.0%]	46.1% [41.9% - 50.1%]
Philippines*	16,300 [16,000 - 16,700]	6.0% [5.7% - 6.2%]	8.7% [8.5% - 9.0%]	9.8% [9.5% - 10.1%]	13.8% [13.5% - 14.1%]	26.5% [25.9% - 27.1%]	35.2% [34.6% - 35.8%]
Republic of Korea	100 [0 - 200]	1.5% [0.0% - 5.4%]	5.3% [0.0% - 11.8%]	2.8% [0.0% - 7.7%]	11.7% [4.2% - 20.5%]	13.6% [5.2% - 22.9%]	65.1% [51.7% - 77.2%]
Singapore	**	4.9% [0.0% - 18.2%]	12.9% [0.0% - 33.4%]	6.9% [0.0% - 23.6%]	16.5% [0.0% - 41.7%]	18.5% [0.0% - 41.7%]	40.3% [13.3% - 71.5%]
Vanuatu	**	2.8% [0.0% - 50.0%]	8.6% [0.0% - 50.0%]	4.4% [0.0% - 50.0%]	13.7% [0.0% - 50.0%]	20.1% [0.0% - 100.0%]	50.5% [0.0% - 100.0%]
Viet Nam	5,700 [2,900 - 9,300]	2.6% [2.1% - 3.1%]	9.4% [8.6% - 10.4%]	4.1% [3.4% - 4.6%]	15.8% [14.8% - 16.9%]	14.5% [13.5% - 15.5%]	53.7% [52.1% - 55.1%]

* Study country. ** Not reported due to small numbers.

2.5 Time varying trends

We considered whether greater vulnerability of younger aged adults to deaths from the delta variant during our recent 6-month study period may have increased the risk of orphanhood among children of younger ages. However, we observed little change in the age-related composition of orphanhood from the initial study period of March 1, 2020 – April 30, 2021 and the subsequent six months (May 1, 2021 – October 31, 2021), Figure S6. There was, however, a suggestion that for 11 countries out of the 16, of a slight decrease in the proportion of adolescents in the six months post original study (Argentina, England & Wales, France, Germany, Italy, Mexico, Nigeria, Peru, Poland, South Africa and Spain) whereas only 3 countries showed a small increase in the proportion of adolescents (Colombia, Malawi, USA). In all countries and time periods, adolescents accounted for at least 50% of pandemic-associated orphanhood.

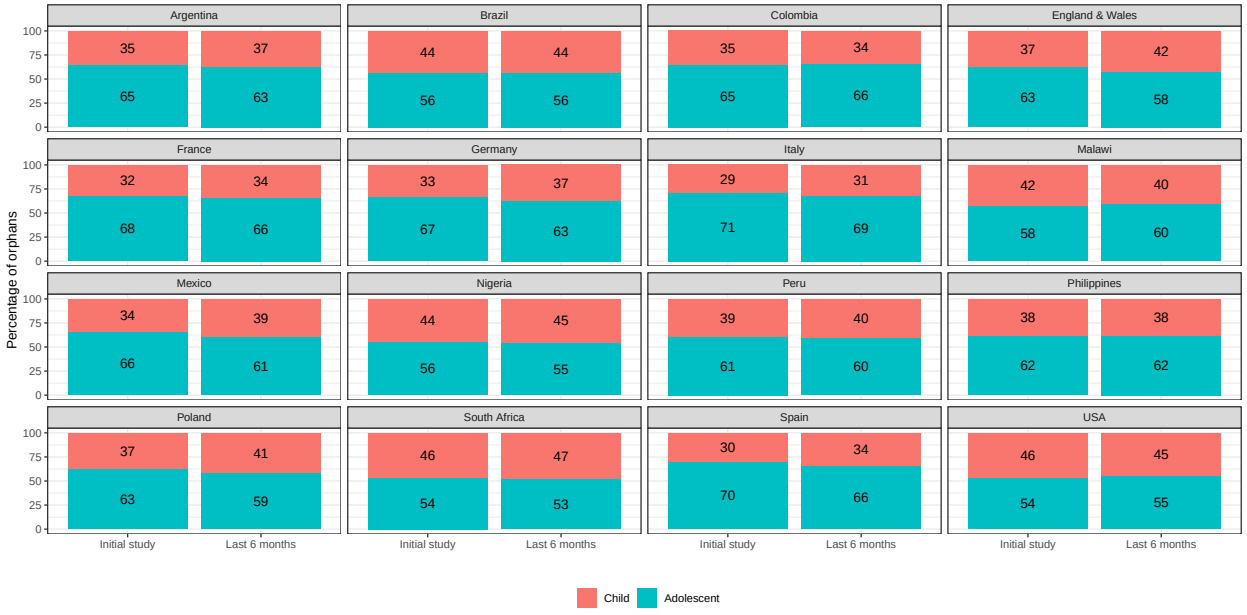

Figure S6: Time varying composition of orphanhood across two time periods: 1) The initial study period in Hillis et al (1st March 2020 – 30th April 2021), 2) The subsequent 6 months (1st May 2021 – 31st October 2021). The red child section includes pre-school children (0-4) and primary school children (5-9). The blue adolescent section includes adolescents (10-17).

2.6 Fertility rate sensitivity analysis

We estimate that 49,100 [48,500 - 49,800] children under one were orphaned globally in 2021 due to COVID-19 associated causes. If we reduce fertility by 20%, we assume 9,800 [9,700 - 10,000] fewer children were orphaned. This is equivalent to 0.29% [0.29% - 0.29%] reduction in our total orphanhood estimates, which is negligible.

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