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Country-specific disease burden of respiratory syncytial virus in children younger than five years in low- and middle-income countrie: a modelling study

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Country-specific disease burden of respiratory syncytial virus in children younger than five years in low- and middle-income countries: a modelling study

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Abstract

Country-level estimates of respiratory syncytial virus (RSV) burden are scarce in low- and middle-income countries (LMICs), particularly for hospital admissions and deaths. We modelled country- and age-specific RSV-associated acute lower respiratory infection (ALRI) incidence and hospital admission rates, and RSV-attributable and RSV-associated all-cause mortality rates, among children under five across 135 LMICs. RSV-associated ALRI incidence ranged from 38.9 to 80.5 per 1,000 person-years and was highest in southern Africa (Botswana, South Africa and Eswatini). RSV-associated ALRI hospital admission rates ranged from 0.8 to 23.2 per 1,000 person-years and were highest in the Democratic People's Republic of Korea, Tajikistan and Ukraine. RSV-attributable and RSV-associated mortality rates ranged from 0.5 to 52.9 and from 1.1 to 120.9 per 100,000 person-years, respectively, with the highest rates in sub-Saharan Africa, including Nigeria, Somalia and Chad. These comparable estimates help fill country-level evidence gaps and can inform equitable prioritisation of RSV immunisation.

Introduction

Respiratory syncytial virus (RSV) is a leading cause of acute lower respiratory infections (ALRI) and a major contributor to morbidity and mortality among young children globally.[1,2] Previous RSV disease burden estimates showed that more than 95% of RSV-associated ALRI episodes and over 97% of RSV-attributable deaths among children younger than five years worldwide occurred in low-income and middle-income countries (LMICs).[1]

The RSV prevention landscape has changed substantially in recent years with the introduction of maternal vaccines (RSVPreF) and long-acting monoclonal antibodies, including nirsevimab and clesrovimab, for infant protection into national immunisation programmes.[3–5] However, as of October 2026, access to

these products remains highly inequitable, with their availability and implementation largely concentrated in high-income countries; only a limited number of middle-income countries have licensed these products, and even fewer have incorporated them into national immunisation programmes. This unequal implementation of RSV passive immunisation products risks perpetuating existing inequities in RSV-related morbidity and mortality.[6] In response to the substantial RSV burden and its potential public health impact in resource-limited settings, Gavi, the Vaccine Alliance, established a maternal RSV vaccine programme for protecting infants as part of its 2026–30 strategic investment plan and opened a funding window to support vaccine introduction.[7] This has been made possible through efforts to obtain a price commitment from Pfizer for supply to Gavi-supported countries, facilitated by the Gates Foundation funding of the development of a more affordable multi-dose presentation of the maternal RSV vaccine.[8] WHO prequalified its multi-dose presentation in September 2026, building on its prequalification of the single-dose presentation in March 2025 and paving the way for Gavi-supported introductions.[9]

Reliable country-level estimates of RSV disease burden are therefore urgently needed to guide prioritisation, country-level decision-making, resource allocation, and future implementation of RSV prevention strategies. However, generating comparable estimates of RSV burden across LMICs remains challenging because population-based surveillance data are scarce and heterogeneous. In this context, model-based approaches extrapolating from available empirical data offer a practical approach to estimating RSV disease burden in resource-limited settings without local or regional data.

The previous two iterations of global RSV disease burden applied a modelling approach for estimating a single outcome of RSV-associated ALRI incidence in children under five years in LMICs; however, no country-level estimation was conducted for hospitalisation or mortality outcomes.[1,2] Building upon the previous work, this study integrated multiple modelling approaches to estimate country-level burden of RSV-associated ALRI incidence in the community,

RSV-associated ALRI hospitalisation, RSV-attributable all-cause mortality and RSV-associated all-cause mortality in children under five years in LMICs, with a particular focus on infants, the target population for RSV immunisation.

Methods

Outcomes and definitions

Our analysis covered 135 low-income and middle-income countries from the 2019 World Bank income classification[10] (appendix p 3). We estimated four RSV disease burden outcomes among children under five years: RSV-associated ALRI incidence, defined as the occurrence of ALRI with laboratory-confirmed RSV infection in the community; RSV-associated ALRI hospital admission, defined as hospital admission due to ALRI with laboratory-confirmed RSV infection; RSV-attributable all-cause mortality, defined as deaths in which RSV was considered to be in the causal pathway, including RSV as the underlying, intermediate (comorbid or antecedent), or immediate cause of death, consistent with the CHAMPS framework;[11,12] and RSV-associated all-cause mortality, defined as deaths with RSV detected in upper respiratory tract samples. RSV-attributable all-cause mortality and RSV-associated all-cause mortality included deaths occurring either in hospitals or out of hospitals.

We selected RSV-attributable all-cause mortality rather than RSV-attributable ALRI mortality as the primary mortality outcome because RSV might contribute to deaths beyond ALRI;[12] RSV-attributable ALRI mortality was additionally estimated solely for comparison with the external modelled estimates by the Global Burden of Disease Study 2023.[13]

Data sources

Three main categories of data sources were used to estimate RSV disease burden. First, we used the previously published RSV burden estimates derived from a systematic review and unpublished data from the Respiratory Virus Global Epidemiology Network (RSV GEN), including income-level-specific RSV-associated ALRI incidence and hospitalisation rates among children aged under five years estimated from pre-COVID-19 studies (i.e., 2019 or before), as well as country-specific RSV-attributable and RSV-associated mortality rates. (**Figure 1**).

Second, we collated country-level prevalence estimates for eight established risk factors for RSV-associated ALRI, including prematurity, low birth weight, presence of siblings, maternal smoking, young maternal age at delivery, paediatric HIV infection, passive smoking, and non-exclusive breastfeeding based on a previously published systematic review and meta-analysis.[14] These data were obtained from publicly available sources, including WHO,[15,16] the World Bank,[17] Demographic and Health Surveys (DHS),[18] and published literature;[19,20] more details can be found in the appendix pp 5-6.

Third, we obtained country-level indicators of health system capacity, child health status, and healthcare utilisation, including under-five mortality rate, neonatal mortality rate, maternal mortality ratio, hospital bed density, physician density, nurse and midwife density, and outpatient and inpatient utilisation rates (appendix pp 11-12). These indicators were sourced from the World Bank,[21–24] UNICEF reports,[25,26] and published studies,[27] and were used to construct a composite healthcare access index to support estimation of country-specific hospitalisation proportions. In addition, country-specific population data in 2019 were obtained from the United Nations World Population Prospects.[28]

Because not all countries had complete data for all variables, for both the country-level prevalence of aforementioned risk factors and indicators, missing values were imputed using a stratified mean imputation approach. Specifically, missing values were first imputed using the mean value among countries within the same World Bank income group and WHO region; if no data were available within the corresponding income group and WHO region stratum, the mean value for the relevant World Bank income group was applied.

Data analysis

As shown in **Figure 1**, separate models were developed for estimating RSV-associated ALRI incidence, ALRI hospital admissions, and RSV-attributable and RSV-associated deaths, for children under five years and infants under one year, as well as age sub-groups of 0–<6, 6–<12, and 12–<60 months.

Estimation of RSV-associated ALRI incidence

We estimated country-specific RSV-associated ALRI incidence using a risk-factor-based modelling approach.[1,3] We assumed that the previously published RSV-associated ALRI incidence estimates by income group reflected the burden of RSV-associated ALRI under the prevailing distribution of the selected risk factors. Therefore, we first estimated a counterfactual baseline incidence rate for each income group, representing the expected RSV-associated ALRI incidence in a hypothetical population with zero prevalence of the selected risk factors, using the published income-specific meta-estimates of RSV-associated ALRI incidence, country-specific prevalence of these risk factors, published odds ratios (ORs) for their associations with RSV-associated ALRI, and country-specific population data. The eight risk factors included in the model, identified through a previous systematic review and meta-analysis,[14] were: (1) prematurity, defined as gestational age <37 weeks; (2) maternal smoking during pregnancy or lactation; (3) young maternal age at delivery, defined as <25

years; (4) low birth weight, defined as birth weight <2.5 kg; (5) absence of breastfeeding; (6) having at least one sibling; (7) household passive smoking exposure; and (8) HIV infection. We then applied the country-specific prevalence of risk factors to the base incidence rate for each income group to derive country-specific RSV-associated ALRI incidence estimates for each of the 135 LMICs (details in appendix pp 4-8).

Estimation of RSV-associated ALRI hospital admission

We estimated country-specific RSV-associated ALRI hospitalisation rates by applying the proportion of RSV-associated ALRI cases in the community requiring hospital admission (referred to as the hospitalisation proportion) to the corresponding country-specific RSV-associated ALRI incidence rates obtained above. Detailed methodology is described in the appendix (pp 9–15).

Briefly, we first identified the most appropriate statistical distribution for the hospitalisation proportion based on empirical data, which was a logit-normal distribution (details in appendix pp 9–11). Subsequently, we used a probabilistic Principal Component Analysis (PCA)-based approach for identifying the optimal first principal component (PC1) that best characterised country-level healthcare access and capacity; we selected the following candidate indicators for inclusion in the PCA: mortality indicators (including under-five, neonatal, and maternal mortality), healthcare capacity indicators (including number of hospital beds, physicians, and nurses and midwives), and healthcare utilisation indicators (including outpatient and inpatient utilisation rates). A list of PCA models with all possible combinations of candidate indicators were explored; rather than using one single best-performing model, we probabilistically sampled from shortlisted PCA models that performed relatively well, defined as those in which PC1 explained more than 80% of the total variance. For each country, we calculated the quantile of its composite index (i.e., PC1) based on the cumulative distribution function (CDF) of the global distribution of PC1,

which we assumed to follow a normal distribution. We then mapped this quantile to the corresponding quantile of the CDF of the age-stratified hospitalisation proportion distribution (i.e., a logit-normal distribution) at the same quantile level to derive country- and age-specific estimates of the hospitalisation proportion. Finally, we applied the estimated hospitalisation proportions to the country-specific RSV-associated ALRI incidence rates; the resulting estimates were further adjusted using uniform scaling factors stratified by World Bank income group and age group to ensure that aggregated hospital admissions were consistent with the previously published estimates at the income-group level.

Estimation of RSV-attributable and RSV-associated all-cause mortality

For both RSV-attributable and RSV-associated all-cause mortality, we applied our previously published prediction model.[1] Detailed methodology is provided in the appendix (pp 16–17). Briefly, using a meta-regression approach, the model estimated country- and age-specific proportions of RSV-attributable and RSV-associated deaths among all-cause deaths. These proportions were subsequently applied to country-specific all-cause deaths derived from 2019 under-five mortality rates to derive estimates of RSV-attributable and RSV-associated mortality.[26]

Quantification of uncertainty

For the incidence rate estimates, income-specific estimates and odds ratios (ORs) were sampled from log-normal distributions to propagate uncertainty. For the hospital admission rate estimates, income-specific estimates were sampled from log-normal distributions, and the PCA model used to derive the composite index was probabilistically sampled from the shortlisted PCA models, with sampling probabilities proportional to the percentage of variance explained by PC1. For mortality estimates, the proportion of RSV-specific deaths among all-cause deaths was sampled from a logit-normal distribution. For

each step of the sampling process, 1,000 random draws were generated, and the 95% uncertainty range (UR) was defined by the 2.5th and 97.5th percentiles of the corresponding estimates.

Model validation

To validate the predicted country-specific estimates, we compiled empirical data for country-specific estimates without modelling. We used data from a previously published global systematic analysis, which consisted of data from published studies and unpublished data from RSV GEN; it should be noted that the meta-estimates of that global systematic analysis also informed the present model, since we aligned the country-specific estimates to make sure they were consistent with the global and regional estimates.[1] We also applied the same search strategy as in that global systematic analysis[1] and updated the search to include studies published between January 2021 and March 2026, which was independent from any inputs for our model.

For RSV-associated ALRI incidence and hospital admission rates, we generated country-level empirical estimates using the following predefined criteria. Firstly, nationally representative multicentre estimates were prioritised when available; when multiple studies provided such estimates, the estimate from the largest study was selected. In the absence of multicentre studies, if there were two or more single-centre studies from the same country, a random-effects meta-analysis was conducted to synthesise the estimates from these studies to yield a country-level estimate. For the main analysis, all empirical data were included; for the sensitivity analysis, only data from published studies identified from the updated literature search were included.

For RSV-associated all-cause mortality and RSV-attributable mortality, the number of available empirical studies was limited. Therefore, all eligible data were included regardless of whether they originated from multicentre or single-centre studies.

The overall agreement between model-based and empirical estimates was evaluated using proportion of overlap, defined as the proportion of model uncertainty estimates overlapping with the empirical estimates. To penalise overly wide model uncertainty estimates, we further calculated the interval overlap fraction, defined as the proportion of the model-based uncertainty interval that overlapped with the corresponding empirical uncertainty interval; the median and interquartile range (IQR) of these interval overlap fractions were calculated across different model estimates.

In addition, we compared our estimates of RSV-attributable ALRI mortality rates with the modelled estimates of RSV LRI mortality in 2019 from the Global Burden of Disease (GBD) 2023,[13] although this is not considered as part of the validation given that the GBD 2023 estimates were also modelled rather than directly calculated with empirical data.

Statistical software

All data analyses were performed using R software (version 4.3.3). An interactive web-based platform was developed to enable visualisation of the modelled RSV burden estimates and is available at https://idem.njmu.edu.cn/shiny/rsvburdenlmic/.

Results

RSV-associated ALRI incidence

Among children under five years, country-specific RSV-associated ALRI incidence rates ranged from 38.9 to 80.5 per 1,000 person-years (median: 50.7). The highest rates clustered in southern Africa, led by Botswana (80.5 [95% UR: 30.3–220.4]), South Africa (74.8 [28.7–187.9]) and Eswatini (66.2 [34.6–118.6]

per 1,000 person-years); Namibia, Lesotho and Zimbabwe were also among the highest-rate countries, such that six of the 20 highest rates were in southern Africa. High incidence rates were otherwise dispersed, also occurring in parts of the Middle East and the Caribbean. In absolute numbers, RSV-associated ALRI counts tracked population size rather than incidence rate: the largest numbers were in India (6.17 million [3.91–9.46]), China (4.56 million [1.96–10.25]) and Nigeria (1.58 million [0.86–3.00]), with India and China together accounting for roughly one third of all global episodes, while Nigeria alone accounted for nearly one-fifth (19.2%) of RSV-associated ALRI episodes across African LMICs. (**Table 1** and **Figure 2**)

Among infants under one year, the higher incidence in southern Africa was even more marked; incidence rates ranged from 57.0 to 156.8 per 1,000 person-years (median 98.6), and six of the ten highest infant rates were in southern Africa: Botswana (156.8 [59.0–429.3]), South Africa (145.8 [56.0–366.0]) and Eswatini (136.4 [71.3–244.3] per 1,000 person-years), followed by Lesotho, Namibia and Zimbabwe (**Table 1** and **Figure 2**). The same patterns persisted for the finer age bands (0–<6 months and 6–<12 months; appendix pp 20–34).

RSV-associated ALRI hospital admissions

Among children under five years, RSV-associated ALRI hospitalisation rates ranged from 0.8 to 23.2 per 1,000 person-years (median 4.2) and showed a markedly different geographic variation than RSV-associated ALRI incidence. The highest hospitalization rates were estimated in the Democratic People's Republic of Korea (23.2 [95% UR: 12.9–44.9]), Tajikistan (22.4 [11.5–43.0]), Ukraine (21.4 [9.5–50.4]) and the Syrian Arab Republic (19.2 [9.9–36.5] per 1,000 person-years); conversely, the lowest rates were in several sub-Saharan African countries, including Equatorial Guinea (0.8 [0.3-2.5]), Namibia (1.5 [0.6-3.6]),

Gabon (1.6 [0.6-4.1]) and Benin (1.6 [0.7-3.5]) per 1,000 person-years. Absolute numbers of hospitalisations were nevertheless concentrated in populous countries: India (0.76 million [0.40–1.39]), China (0.42 million [0.19–0.87]) and Egypt (0.14 million [0.07–0.30]). (**Table 1** and **Figure 2**)

Among infants under one year, hospitalisation rates ranged from 4.1 to 66.2 per 1,000 person-years (median 14.9), with similar rankings by country to the 0–<60 months group: the highest rates were in Ukraine (66.2 [26.7–153.1]), Sri Lanka (50.3 [23.5–108.4]), the Republic of Moldova (49.9 [22.3–113.4]), the Democratic People's Republic of Korea (47.3 [28.5–78.1]) and Tajikistan (46.8 [26.7–82.3] per 1,000 person-years) (**Table 1** and **Figure 2**). The same patterns persisted for the finer age bands (0–<6 months and 6–<12 months; appendix pp 20–34).

RSV-attributable and RSV-associated all-cause deaths

Among children under five years, RSV-attributable mortality rates ranged from 0.5 to 52.9 per 100,000 person-years (median 10.2). The highest mortality rates were concentrated in sub-Saharan Africa—Nigeria (52.9 [22.8–108.0]), Somalia (52.8 [25.2–112.4]) and Chad (50.5 [22.8–113.3]), followed by the Central African Republic (48.6 [23.6–101.3]) and Sierra Leone (46.5 [23.2–97.2] per 100,000 person-years); by comparison, European countries had lower mortality rates. In absolute terms, Nigeria contributed the most deaths (17,700 [7,600–36,100]), followed by India (15,100 [8,100–31,100]), Pakistan (7,400 [3,600–15,400]) and the Democratic Republic of the Congo (5,600 [2,700–11,700]) (**Table 2** and **Figure 3**).

RSV-associated mortality followed the same geographic pattern but was roughly twice as large in magnitude: among children under five years, mortality rates ranged from 1.1 to 120.9 (median 23.6) per 100,000 person-years.

Among infants under one year, country-specific RSV-attributable mortality rates ranged from 1.9 to 157.9 per 100,000 person-years, again led by Nigeria (157.9 [68.3–321.1]), Somalia (152.1 [72.8–322.5]) and Chad (148.2 [67.2–330.8]) (**Table 2** and **Figure 3**). Similar patterns were observed for country-specific RSV-associated mortality rates and for the finer age bands (0–<6 months and 6–<12 months; appendix pp 35–48).

We additionally calculated the ratio of the estimated RSV-attributable mortality to RSV-associated ALRI incidence, which reflects the likelihood of dying among RSV-associated ALRI cases. This ratio varied substantially across individual countries and country income groups, with higher ratios in poor countries, ranging from 1.21% (95% UR: 0.73–2.00%) in low-income countries to 0.61% (0.39–0.96%) in lower-middle-income countries and 0.16% (0.07–0.36%) in upper-middle-income countries among infants under one year, and from 0.59% (0.35–0.98%) to 0.39% (0.25–0.61%) and 0.08% (0.04–0.18%), respectively, among those under five years. The highest ratios were observed predominantly in sub-Saharan Africa, with Sierra Leone, the Central African Republic, and Chad ranking highest among infants under one year, whereas Nigeria had the highest ratio among children under five years (appendix pp 49–50).

Model validation

A total of 56 studies with extractable empirical data were identified for model validation (appendix p 51), including 18 studies that were not used in the current model estimation, of which 16 were identified through the updated systematic literature search and two through RSV GEN.

Overall, all model-based estimates showed high agreement with country-level estimates from empirical data across age groups (**Figure 4**). For RSV-associated ALRI incidence, the uncertainty intervals overlapped in all age strata (i.e., proportion of overlap: 100%, 13/13). The median interval overlap fraction was 0.51 (IQR 0.27–0.73). For RSV-associated hospitalisation rates, the proportion of overlap ranged from 75.0% in children under five years to

100.0% across all other age strata, with an overall overlap proportion of 93.8% (15/16). The median interval overlap fraction was 0.17 (IQR 0.05–0.41). For RSV-associated ALRI incidence and hospitalisation rates, sensitivity analyses restricted to independent studies yielded consistent results, with 100.0% uncertainty interval overlap across all age groups for both outcomes. The median interval overlap fraction was 0.55 (IQR 0.49–0.67) for incidence and 0.21 (IQR 0.06–0.52) for hospital admissions (appendix pp 52–60).

Validation data for mortality outcomes were limited. For RSV-attributable all-cause mortality, a single age-specific estimate (under five years) showed overlapping uncertainty intervals between model-based and empirical estimates, with an interval overlap fraction of 0.48 (**Figure 4**). For RSV-associated all-cause mortality, uncertainty intervals overlapped for 100.0% of estimates in children aged 0–<6 months, 6–<12 months, and under one year, and 50.0% of estimates in those under five years, resulting in an overall overlap proportion of 85.7% (6/7); the median interval overlap fraction was 0.55 (IQR 0.29–0.60) (**Figure 4**). The estimated RSV-attributable ALRI mortality estimates in this study were generally similar to the RSV-LRI mortality estimates from the GBD 2023 study (appendix pp 61–63).

Discussion

In this modelling study, we provide, to our knowledge, the first comprehensive and internally comparable country-level estimates of RSV-associated ALRI incidence, hospital admissions, and both RSV-attributable and RSV-associated all-cause mortality among children under five years across 135 low- and middle-income countries. By integrating published epidemiological evidence with country-specific demographic characteristics, risk factor profiles, and

health-system indicators within a unified modelling framework, the generated estimates help address knowledge gaps on paediatric RSV disease burden, and could further support decision making on the introduction of RSV immunisation for countries where empirical data are sparse or absent.

Substantial geographical heterogeneity was observed across RSV-associated ALRI incidence, hospital admissions, and mortality outcomes. Southern African countries, including Botswana, South Africa, and Eswatini, had the highest estimated incidence rates, whereas the highest hospital admission rates were estimated in the Democratic People's Republic of Korea, Tajikistan, Ukraine, and the Syrian Arab Republic, and mortality rates were highest in sub-Saharan Africa, particularly Nigeria, Somalia, and Chad. These contrasting patterns indicate that incidence, hospital admission, and mortality represent distinct dimensions of RSV burden rather than a simple continuum from infection to death. The high incidence observed in southern Africa is consistent with the exceptionally high prevalence of HIV infection in the region,[29] an established risk factor for severe RSV disease.[14,30] In addition, HIV-exposed but uninfected infants have been reported to have an increased risk of RSV-associated hospitalisation,[31] which may also contribute to the RSV burden in this region. Beyond incidence, hospital admissions and mortality are additionally shaped by differences in healthcare access, care-seeking behaviour, admission practices, and broader health-system capacity, resulting in patterns that do not necessarily overlap with areas of highest incidence. This distinction is particularly important in low-income settings, where barriers to hospital care may prevent some children with severe RSV disease from being admitted. Hospitalisation rates should therefore be interpreted alongside incidence and mortality estimates. In our study, the ratio of RSV-attributable mortality rate to RSV-associated ALRI incidence rate among infants was highest in some of the poorest countries, including Sierra Leone (2.1%), the Central African Republic (2.0%), and Chad (1.9%). Limited access to timely hospital care may partly contribute to the high mortality-to-incidence ratio estimated for these settings. In resource-constrained communities in Argentina, RSV community mortality among infants was comparable to hospital-based mortality in the same population,[32] while

in a remote tribal community in India, 93% of RSV-associated ALRI deaths occurred in the community,[33] highlighting the substantial contribution of community deaths in settings with limited access to care. Given that healthcare capacity and access are unlikely to improve substantially in the short term in such settings, RSV immunisation could provide a more immediate strategy to reduce severe RSV disease, ease pressure on constrained health systems, and consequently reduce mortality. A recent study in Bangladesh reported that 18.4% of children requiring hospitalisation (for any causes) were denied admission because of insufficient bed capacity, with a higher risk of death than among admitted children (hazard ratio 1.56 [95% CI 1.34–1.81]).[34] These findings support prioritising RSV immunisation in resource-limited settings, where rapid reductions in severe RSV disease could also help relieve pressure on constrained health systems.

The validity of our modelling framework is supported by multiple validation analyses. Model-based estimates showed consistently high agreement with empirical data for both RSV-associated ALRI incidence and hospital admission rates, and sensitivity analyses restricted to independent validation studies yielded similar results, supporting the generalisability of the framework beyond the data used for model development. Although empirical data for mortality validation remain limited, available estimates were broadly consistent with our model predictions, except in South Africa and India, where some differences were observed. In South Africa, our estimated RSV-associated mortality among both infants under one year and children aged under five years exceeded the estimates reported by Moyes and colleagues;[35] this difference might partly reflect differences in case definitions, as their surveillance focused on severe acute respiratory infection (SARI), whereas our primary estimates were not restricted to those with diagnosed respiratory tract infections; moreover, Moyes and colleagues used a different estimation approach for the overall mortality by extrapolating from estimated in-hospital deaths to overall deaths with multipliers, and the authors noted that their estimates might represent a minimum estimate of RSV mortality based on emerging evidence from community-

238 based mortality studies.[35] In India, the validation estimate was derived from active community-based surveillance in a remote tribal community, where 93%
239 of RSV-related ALRI deaths occurred in the community rather than in hospitals.[33] The study population was drawn from a resource-constrained setting with
240 limited access to healthcare, and the observed mortality may therefore have been higher than the national average, potentially contributing to the higher
241 empirical estimate than our country-level mortality estimate.

242 For mortality estimation, we did not restrict the primary outcome to lower respiratory infection because RSV can contribute to death through broader causal
243 pathways, particularly in LMIC settings where childhood deaths often involve multiple contributing causes.[12] Our primary analysis estimated RSV-attributable
244 all-cause mortality using the CHAMPS conceptual framework, in which RSV could contribute as an underlying, intermediate, or immediate cause of death.
245 This broader definition partly explains why our mortality estimates were generally higher than those from GBD 2023,[13] which estimated RSV-attributable
246 deaths restricted to lower respiratory infection. To improve comparability and minimise differences arising from outcome definition, we additionally
247 estimated RSV-attributable LRI mortality using the same definition as GBD 2023. Under this definition, our estimates were generally similar to the RSV-
248 attributable LRI mortality estimates from GBD 2023.

249 Previous RSV burden assessments have largely focused on global, regional, or income-group estimates, providing limited evidence for country-level priority
250 setting. We addressed this gap by developing an integrated analytical framework that combines epidemiological evidence, demographic data, country-
251 specific risk profiles, and health-system indicators to generate harmonised RSV burden estimates for 135 LMICs. These estimates reveal substantial between-
252 country heterogeneity that would otherwise be masked by regional averages and have important implications for the introduction and scale-up of emerging
253 RSV prevention strategies. Although modelled estimates cannot replace primary RSV data, such data are broadly unavailable for many LMICs. Given local

evidence remains limited, country-specific modelled estimates could help fill the gap and facilitate more timely decisions on RSV immunisation. This is particularly important in high-mortality settings, where primary RSV data are often scarce; the absence of local evidence should not itself become a barrier to decisions on RSV immunisation and setting up surveillance systems should not delay or preclude introduction.[36] Recent projections suggest that unequal implementation of RSV immunisation could perpetuate existing global inequities in infant RSV mortality.[6] By providing comparable estimates for each LMIC, our framework could help reduce inequalities in the evidence available to support immunisation decisions and promote more equitable access to RSV prevention. The use of modelled estimates to guide immunisation policy has previously been demonstrated for influenza vaccination through the GLaMOR project[37] and for pneumococcal conjugate vaccine introduction in resource-limited settings.[38] Our country-level RSV burden estimates could serve a similar role by providing locally relevant evidence for countries where primary data are limited. As Gavi has now established an RSV Maternal Vaccine Programme and LICs can now apply for introduction,[39] these estimates could inform ongoing national introduction planning and support evidence-based resource allocation. Moreover, these estimates can potentially help maximise global RSV immunisation impact by identifying countries with the largest absolute mortality burden, such as Nigeria, India, and Pakistan, as well as those with the highest mortality rates, such as Somalia and Chad.

Our study has several limitations. First, some country-level covariate data were unavailable and were imputed using mean values from countries within the same income group and WHO region, an approach that may not fully capture local-level heterogeneity. Second, predictor selection across our models had to balance relevance to each outcome with the availability of comparable country-level data, and not all potentially relevant predictors could therefore be included. Limited availability of empirical data also precluded the use of meta-regression to directly model hospitalisation proportions. Instead, hospitalisation proportions were derived using a composite proxy of healthcare access and capacity, which may not fully capture within-country

heterogeneity in healthcare utilisation, care-seeking behaviour, and referral pathways. Third, the available mortality data did not allow deaths occurring within and outside health facilities to be estimated separately. Further studies that systematically capture both in-facility and out-of-facility deaths are needed to better characterise the distribution of RSV mortality by place of death. Finally, while our updated literature search spanning up to March 2026 provided an independent dataset that confirmed model robustness, our primary baseline estimates are anchored in 2019 data to avoid the severe epidemiological disruptions associated with the COVID-19 pandemic.[40] Future iterations should continue to monitor how post-pandemic respiratory viral dynamics shift these baselines over time.

In summary, this study provides the first comprehensive and comparable country-level estimates of RSV-associated ALRI incidence, hospital admission, and mortality across 135 LMICs using a unified modelling framework. These estimates reveal high RSV burden with substantial between-country variation, and should help address evidence gaps in settings where primary RSV data are limited. By reducing inequalities in the evidence available for decision-making, our findings could support more equitable prioritisation and implementation of RSV immunisation, particularly in the highest burden countries.

Contributors

YL conceptualised the study with inputs from DRF and ES. SR led data collection with inputs from SD and YX. SR and SD co-led data analysis with inputs from YX. YL led data interpretation with inputs from SR and SD. SR wrote the first draft with inputs from SD, ES, DRF, ADC, VEP, HN, and YL. All authors reviewed

and approved the final manuscript. SR, SD, and YL had full access to and verified the aggregated study data used in the analysis and had final responsibility for the decision to submit for publication.

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Data sharing

All study data included in the analysis are in the public domain and have been properly cited.

Declaration of interests

VEP reports grants from NIH/NIAID and MSD outside the submitted work. HN reports grants from WHO, the National Institute for Health Research, MSD, Pfizer, and AstraZeneca/Icosavax; and personal fees from the Gates Foundation, Pfizer, Moderna, GSK, AstraZeneca, Sanofi, outside the submitted work. YL reports grants from WHO to his institution, related to the submitted work; grants from GSK, Pfizer, MSD and WHO to institution, consultancy fees from Pfizer, GSK, MSD, Sanofi, and WHO, outside the submitted work. All other authors declare no competing interests.

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Tables

Table 1. Country-specific estimates of RSV-associated ALRI incidence and hospital admissions, by age group.

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
Lower-income					
Afghanistan	0-<12m	66.1 (34.5–133.8)	76,700 (40,000–155,100)	12.0 (7.3–20.7)	13,900 (8,400–24,000)
	0-<60m	45.2 (23.5–91.3)	254,700 (132,800–515,100)	3.8 (2.1–7.0)	21,500 (11,800–39,500)
Burkina Faso	0-<12m	67.7 (34.9–133.5)	48,500 (25,100–95,700)	13.3 (8.1–21.8)	9,500 (5,800–15,600)
	0-<60m	46.2 (23.9–91.2)	157,500 (81,300–310,700)	4.3 (2.4–8.0)	14,600 (8,100–27,100)
Burundi	0-<12m	60.2 (30.5–119.9)	25,100 (12,700–50,000)	13.1 (8.0–21.3)	5,500 (3,300–8,900)
	0-<60m	41.1 (20.8–81.9)	83,000 (42,100–165,300)	4.4 (2.4–7.9)	8,900 (4,900–16,000)
Central African Republic	0-<12m	74.4 (36.5–154.0)	11,200 (5,500–23,300)	8.0 (4.4–14.7)	1,200 (700–2,200)
	0-<60m	50.8 (24.9–105.1)	37,200 (18,300–77,000)	2.2 (1.1–4.4)	1,600 (800–3,200)
Chad	0-<12m	79.5 (35.7–163.7)	48,700 (21,900–100,200)	9.4 (5.1–17.7)	5,800 (3,100–10,900)
	0-<60m	54.3 (24.4–111.8)	156,000 (70,100–321,100)	2.6 (1.2–5.4)	7,500 (3,600–15,600)
Congo, Dem. Rep.	0-<12m	66.4 (33.8–135.1)	217,400 (110,800–442,700)	14.1 (8.9–21.6)	46,000 (29,100–70,800)
	0-<60m	45.3 (23.1–92.3)	702,400 (358,200–1,430,700)	4.7 (2.7–7.8)	73,000 (41,100–121,100)
Eritrea	0-<12m	68.0 (34.3–137.6)	7,100 (3,600–14,300)	18.0 (11.0–31.0)	1,900 (1,100–3,200)
	0-<60m	46.4 (23.4–94.0)	22,800 (11,500–46,100)	6.4 (3.5–12.0)	3,100 (1,700–5,900)
Ethiopia	0-<12m	64.1 (33.4–124.5)	220,600 (115,000–428,600)	12.1 (7.6–19.5)	41,800 (26,300–67,100)
	0-<60m	43.8 (22.8–85.0)	724,800 (377,900–1,408,100)	3.9 (2.2–7.0)	64,700 (35,800–115,900)
Gambia, The	0-<12m	67.5 (34.2–131.7)	5,700 (2,900–11,200)	13.8 (8.2–23.5)	1,200 (700–2,000)

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
	0-<60m	46.1 (23.3–89.9)	18,500 (9,400–36,200)	4.6 (2.5–8.6)	1,800 (1,000–3,400)
Guinea	0-<12m	73.2 (35.4–158.5)	31,900 (15,400–69,000)	12.5 (7.2–23.1)	5,400 (3,100–10,100)
	0-<60m	50.0 (24.1–108.2)	103,000 (49,700–222,900)	3.9 (2.1–7.6)	8,100 (4,300–15,600)
Guinea-Bissau	0-<12m	66.7 (33.9–135.7)	4,100 (2,100–8,400)	13.0 (7.7–22.2)	800 (500–1,400)
	0-<60m	45.6 (23.1–92.7)	13,700 (6,900–27,800)	4.2 (2.2–8.3)	1,300 (700–2,500)
Haiti	0-<12m	70.2 (35.3–142.3)	17,900 (9,000–36,300)	18.0 (9.0–36.2)	4,600 (2,300–9,200)
	0-<60m	47.9 (24.1–97.2)	60,600 (30,500–122,900)	6.3 (2.8–15.0)	8,000 (3,600–19,000)
Korea, Dem. Rep.	0-<12m	60.8 (31.9–113.1)	21,600 (11,300–40,300)	47.3 (28.5–78.1)	16,800 (10,100–27,800)
	0-<60m	41.5 (21.8–77.2)	72,400 (37,900–134,600)	23.2 (12.9–44.9)	40,400 (22,400–78,300)
Liberia	0-<12m	65.2 (33.9–134.5)	9,900 (5,200–20,400)	12.4 (7.5–23.2)	1,900 (1,100–3,500)
	0-<60m	44.5 (23.1–91.9)	32,500 (16,900–67,200)	4.0 (2.2–8.5)	2,900 (1,600–6,200)
Madagascar	0-<12m	83.6 (40.5–178.0)	71,100 (34,400–151,300)	16.2 (9.6–28.0)	13,700 (8,100–23,800)
	0-<60m	57.1 (27.6–121.6)	229,700 (111,100–489,100)	5.2 (2.8–10.0)	21,000 (11,400–40,400)
Malawi	0-<12m	73.7 (33.4–141.7)	43,600 (19,800–83,900)	19.0 (10.7–32.8)	11,200 (6,300–19,400)
	0-<60m	50.3 (22.8–96.7)	144,800 (65,600–278,300)	6.7 (3.4–12.8)	19,200 (9,800–37,000)
Mali	0-<12m	71.3 (34.9–141.1)	53,300 (26,100–105,500)	11.2 (6.5–19.4)	8,400 (4,900–14,500)
	0-<60m	48.7 (23.8–96.3)	172,000 (84,100–340,200)	3.4 (1.9–6.6)	12,100 (6,600–23,100)
Mozambique	0-<12m	78.4	83,400	17.4	18,500

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
		(38.6–155.2)	(41,000–165,200)	(10.2–29.7)	(10,800–31,700)
	0-<60m	53.5 (26.3–106.0)	270,400 (132,900–535,200)	5.9 (3.1–10.6)	29,900 (15,700–53,300)
Niger	0-<12m	80.2 (37.9–162.7)	80,100 (37,900–162,600)	10.0 (5.4–18.4)	10,000 (5,400–18,400)
	0-<60m	54.8 (25.9–111.1)	254,200 (120,100–515,900)	2.9 (1.5–5.5)	13,200 (6,800–25,600)
Rwanda	0-<12m	57.0 (30.1–106.6)	22,500 (11,900–42,100)	15.2 (9.8–22.8)	6,000 (3,900–9,000)
	0-<60m	38.9 (20.5–72.8)	71,900 (38,000–134,500)	5.3 (3.1–9.2)	9,900 (5,700–17,000)
Sierra Leone	0-<12m	68.0 (34.4–143.4)	16,300 (8,200–34,300)	10.6 (6.1–19.1)	2,500 (1,500–4,600)
	0-<60m	46.4 (23.5–97.9)	53,300 (27,000–112,400)	3.2 (1.7–6.2)	3,700 (1,900–7,100)
Somalia	0-<12m	81.8 (38.8–173.1)	48,700 (23,100–103,200)	9.2 (4.7–18.6)	5,500 (2,800–11,100)
	0-<60m	55.8 (26.5–118.2)	153,400 (72,800–324,800)	2.6 (1.1–6.2)	7,100 (3,200–16,900)
South Sudan	0-<12m	76.6 (38.0–160.4)	27,100 (13,500–56,800)	10.4 (6.1–18.6)	3,700 (2,200–6,600)
	0-<60m	52.3 (25.9–109.5)	88,900 (44,100–185,900)	3.1 (1.6–5.9)	5,200 (2,800–10,000)
Sudan	0-<12m	68.3 (34.5–134.0)	88,800 (44,900–174,200)	17.6 (10.8–28.9)	22,900 (14,000–37,600)
	0-<60m	46.6 (23.6–91.5)	291,200 (147,200–571,500)	6.1 (3.4–11.2)	38,200 (21,400–69,900)
Syrian Arab Republic	0-<12m	73.6 (33.7–164.3)	29,500 (13,500–65,900)	43.0 (23.9–78.9)	17,300 (9,600–31,600)
	0-<60m	50.3 (23.0–112.2)	91,800 (42,000–205,000)	19.2 (9.9–36.5)	35,100 (18,100–66,700)
Tajikistan	0-<12m	67.6 (34.2–138.5)	18,500 (9,300–37,800)	46.8 (26.7–82.3)	12,800 (7,300–22,500)
	0-<60m	46.2 (23.4–94.6)	62,100 (31,500–127,300)	22.4 (11.5–43.0)	30,200 (15,500–57,900)

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
Togo	0-<12m	61.2 (31.4–125.0)	15,300 (7,800–31,200)	11.7 (7.2–19.3)	2,900 (1,800–4,800)
	0-<60m	41.8 (21.4–85.3)	50,300 (25,800–102,700)	3.7 (2.1–7.1)	4,500 (2,600–8,600)
Uganda	0-<12m	67.4 (35.2–130.7)	107,300 (56,000–208,000)	20.4 (12.9–33.1)	32,500 (20,600–52,700)
	0-<60m	46.0 (24.0–89.2)	353,700 (184,600–685,800)	7.6 (4.2–13.2)	58,500 (32,500–101,600)
Yemen, Rep.	0-<12m	80.7 (36.9–183.3)	66,500 (30,400–151,000)	24.0 (12.8–45.1)	19,800 (10,600–37,200)
	0-<60m	55.1 (25.2–125.2)	226,000 (103,200–513,000)	8.8 (4.4–18.1)	36,100 (18,000–74,200)
Lower-middle-income					
Algeria	0-<12m	96.1 (47.3–185.1)	97,900 (48,100–188,400)	25.2 (10.7–57.3)	25,600 (10,900–58,300)
	0-<60m	46.7 (23.0–89.9)	234,500 (115,300–451,400)	6.2 (2.5–15.1)	31,200 (12,700–75,700)
Angola	0-<12m	100.4 (52.6–194.3)	118,900 (62,300–230,100)	13.5 (6.2–32.5)	16,000 (7,400–38,500)
	0-<60m	48.8 (25.6–94.4)	276,400 (144,900–535,100)	2.7 (1.2–6.0)	15,500 (6,700–34,200)
Bangladesh	0-<12m	110.7 (59.7–196.5)	318,300 (171,700–565,000)	22.0 (10.3–47.9)	63,200 (29,500–137,800)
	0-<60m	53.7 (29.0–95.4)	775,000 (418,200–1,375,800)	5.1 (2.5–10.9)	73,400 (36,200–156,700)
Benin	0-<12m	93.3 (51.0–185.6)	36,800 (20,100–73,100)	8.6 (4.1–18.9)	3,400 (1,600–7,500)
	0-<60m	45.3 (24.7–90.1)	84,900 (46,400–168,900)	1.6 (0.7–3.5)	3,000 (1,300–6,600)
Bhutan	0-<12m	104.1 (53.9–202.3)	1,400 (700–2,600)	29.4 (13.2–67.8)	400 (200–900)
	0-<60m	50.5 (26.2–98.2)	3,200 (1,600–6,200)	7.6 (3.4–17.2)	500 (200–1,100)
Bolivia	0-<12m	83.5 (45.5–152.5)	19,800 (10,800–36,100)	22.1 (10.4–48.0)	5,200 (2,500–11,400)

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
	0-<60m	40.5 (22.1–74.0)	48,100 (26,200–87,800)	5.6 (2.7–11.4)	6,700 (3,200–13,500)
Cabo Verde	0-<12m	94.8 (51.2–179.9)	900 (500–1,800)	35.3 (16.0–78.8)	400 (200–800)
	0-<60m	46.0 (24.9–87.4)	2,400 (1,300–4,600)	9.7 (4.5–21.0)	500 (200–1,100)
Cambodia	0-<12m	86.2 (48.6–157.4)	30,400 (17,100–55,600)	18.9 (9.0–39.9)	6,700 (3,200–14,100)
	0-<60m	41.9 (23.6–76.4)	74,500 (41,900–136,000)	4.5 (2.0–9.5)	8,000 (3,500–16,900)
Cameroon	0-<12m	98.3 (52.1–191.9)	82,800 (43,900–161,600)	12.8 (5.6–30.6)	10,800 (4,700–25,800)
	0-<60m	47.7 (25.3–93.2)	193,700 (102,700–378,200)	2.6 (1.1–6.4)	10,600 (4,300–26,100)
Comoros	0-<12m	129.3 (62.5–273.5)	3,200 (1,600–6,800)	25.1 (10.6–56.9)	600 (300–1,400)
	0-<60m	62.8 (30.4–132.8)	7,700 (3,700–16,300)	5.7 (2.3–13.9)	700 (300–1,700)
Congo, Rep.	0-<12m	97.6 (49.9–191.4)	16,100 (8,200–31,600)	16.1 (7.0–35.4)	2,700 (1,200–5,800)
	0-<60m	47.4 (24.2–93.0)	38,600 (19,700–75,700)	3.4 (1.5–7.6)	2,700 (1,200–6,200)
Côte d'Ivoire	0-<12m	112.5 (57.1–221.6)	96,300 (48,900–189,700)	14.4 (6.2–34.2)	12,400 (5,300–29,200)
	0-<60m	54.6 (27.7–107.6)	221,300 (112,300–435,900)	2.9 (1.3–6.5)	11,900 (5,400–26,200)
Djibouti	0-<12m	117.5 (59.1–241.6)	2,200 (1,100–4,600)	18.1 (7.8–43.2)	300 (100–800)
	0-<60m	57.1 (28.7–117.3)	5,700 (2,900–11,700)	3.7 (1.7–8.8)	400 (200–900)
Egypt, Arab Rep.	0-<12m	109.5 (56.2–202.1)	263,700 (135,200–486,700)	39.5 (16.6–84.6)	95,200 (39,900–203,700)
	0-<60m	53.2 (27.3–98.1)	680,800 (349,200–1,256,700)	10.8 (5.1–23.7)	138,800 (65,300–303,900)
El Salvador	0-<12m	87.4	10,200	40.5	4,700

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		(46.6–163.1)	(5,500–19,100)	(18.4–85.5)	(2,100–10,000)
	0-<60m	42.4 (22.6–79.2)	24,500 (13,100–45,700)	12.0 (5.7–25.4)	6,900 (3,300–14,700)
Eswatini	0-<12m	136.4 (71.3–244.3)	4,100 (2,100–7,300)	29.4 (13.1–66.6)	900 (400–2,000)
	0-<60m	66.2 (34.6–118.6)	9,500 (5,000–17,100)	6.9 (3.1–15.8)	1,000 (400–2,300)
Ghana	0-<12m	90.5 (49.0–163.3)	76,000 (41,100–137,000)	14.9 (6.8–33.4)	12,500 (5,700–28,000)
	0-<60m	44.0 (23.8–79.3)	181,800 (98,400–327,800)	3.2 (1.4–7.5)	13,400 (5,600–30,800)
Honduras	0-<12m	92.8 (47.0–176.5)	19,400 (9,800–36,900)	26.2 (11.1–59.7)	5,500 (2,300–12,500)
	0-<60m	45.0 (22.8–85.7)	45,500 (23,100–86,600)	6.6 (2.8–15.3)	6,700 (2,800–15,400)
India	0-<12m	108.9 (69.0–166.7)	2,602,300 (1,648,400–3,986,100)	26.7 (14.8–47.2)	637,600 (353,800–1,127,200)
	0-<60m	52.9 (33.5–81.0)	6,172,900 (3,910,000–9,455,200)	6.5 (3.5–11.9)	755,400 (404,100–1,393,100)
Kenya	0-<12m	85.3 (50.2–158.8)	119,500 (70,300–222,400)	15.5 (7.8–34.1)	21,800 (10,900–47,700)
	0-<60m	41.4 (24.4–77.1)	290,500 (170,800–540,600)	3.4 (1.7–7.3)	23,900 (11,700–51,200)
Kiribati	0-<12m	91.1 (49.2–164.1)	300 (100–500)	18.5 (8.7–40.0)	60 (30–100)
	0-<60m	44.3 (23.9–79.7)	700 (400–1,200)	4.3 (2.0–9.5)	60 (30–100)
Kyrgyz Republic	0-<12m	94.3 (49.7–184.8)	13,200 (7,000–25,900)	40.0 (17.9–89.5)	5,600 (2,500–12,500)
	0-<60m	45.8 (24.1–89.7)	35,300 (18,600–69,300)	11.6 (5.5–26.6)	8,900 (4,200–20,500)
Lao PDR	0-<12m	106.2 (54.3–198.2)	17,300 (8,800–32,300)	21.4 (10.1–47.0)	3,500 (1,700–7,700)
	0-<60m	51.5 (26.4–96.2)	41,000 (21,000–76,500)	4.9 (2.4–11.4)	3,900 (1,900–9,000)

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Lesotho	0-<12m	123.8 (68.6–226.3)	6,700 (3,700–12,200)	20.9 (9.8–49.2)	1,100 (500–2,700)
	0-<60m	60.1 (33.3–109.9)	15,200 (8,400–27,800)	4.6 (2.0–10.2)	1,200 (500–2,600)
Mauritania	0-<12m	107.1 (55.4–210.1)	15,100 (7,800–29,600)	17.9 (7.9–43.2)	2,500 (1,100–6,100)
	0-<60m	52.0 (26.9–102.0)	35,300 (18,300–69,300)	4.0 (1.7–8.6)	2,700 (1,200–5,800)
Micronesia, Fed. Sts.	0-<12m	99.0 (52.5–193.3)	300 (200–600)	28.6 (12.8–65.6)	90 (40–200)
	0-<60m	48.1 (25.5–93.9)	500 (300–1,000)	7.2 (3.5–16.6)	80 (40–200)
Moldova	0-<12m	101.8 (52.2–197.0)	3,900 (2,000–7,500)	49.9 (22.3–113.4)	1,900 (800–4,300)
	0-<60m	49.4 (25.3–95.6)	10,200 (5,200–19,700)	15.6 (6.9–32.1)	3,200 (1,400–6,600)
Mongolia	0-<12m	92.7 (48.8–177.5)	6,700 (3,500–12,800)	46.2 (21.7–100.0)	3,300 (1,600–7,200)
	0-<60m	45.0 (23.7–86.2)	17,000 (9,000–32,600)	14.0 (6.3–30.3)	5,300 (2,400–11,400)
Morocco	0-<12m	109.0 (56.6–220.6)	69,300 (36,000–140,300)	32.7 (13.8–75.7)	20,800 (8,800–48,200)
	0-<60m	52.9 (27.5–107.1)	178,400 (92,600–361,000)	8.5 (3.6–18.8)	28,600 (12,200–63,500)
Myanmar	0-<12m	104.2 (56.1–204.4)	96,900 (52,200–190,100)	20.7 (9.9–47.7)	19,300 (9,200–44,300)
	0-<60m	50.6 (27.2–99.3)	228,300 (122,900–447,800)	4.9 (2.2–11.0)	22,200 (10,000–49,500)
Nepal	0-<12m	101.9 (55.3–194.7)	55,400 (30,100–105,900)	23.1 (9.8–57.3)	12,500 (5,300–31,200)
	0-<60m	49.5 (26.8–94.6)	133,900 (72,700–256,000)	5.6 (2.1–13.8)	15,200 (5,800–37,400)
Nicaragua	0-<12m	93.2 (46.9–179.3)	12,200 (6,100–23,500)	30.5 (13.2–68.3)	4,000 (1,700–9,000)
	0-<60m	45.2	29,900	8.0	5,300

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		(22.8–87.1)	(15,100–57,600)	(3.4–17.8)	(2,300–11,800)
Nigeria	0-<12m	97.2 (53.0–184.7)	679,900 (371,100–1,292,200)	12.1 (5.3–28.8)	84,700 (37,200–201,200)
	0-<60m	47.2 (25.8–89.7)	1,576,600 (860,400–2,996,200)	2.3 (1.0–5.7)	76,900 (34,200–190,300)
Pakistan	0-<12m	100.3 (54.2–178.9)	578,700 (312,800–1,032,900)	15.5 (7.1–34.6)	89,400 (41,100–199,800)
	0-<60m	48.7 (26.3–86.9)	1,346,800 (727,800–2,403,600)	3.3 (1.3–7.3)	90,400 (36,900–201,300)
Papua New Guinea	0-<12m	109.2 (57.5–211.0)	24,700 (13,000–47,700)	13.1 (5.8–31.6)	3,000 (1,300–7,100)
	0-<60m	53.0 (27.9–102.5)	58,100 (30,600–112,300)	2.6 (1.0–6.1)	2,900 (1,100–6,700)
Philippines	0-<12m	97.1 (51.3–179.9)	192,900 (102,000–357,700)	28.6 (12.9–62.0)	56,900 (25,700–123,300)
	0-<60m	47.1 (24.9–87.4)	507,800 (268,300–941,400)	7.5 (3.3–16.1)	80,900 (35,200–173,300)
Senegal	0-<12m	97.6 (52.2–190.7)	51,100 (27,300–1e+05)	13.2 (6.1–28.9)	6,900 (3,200–15,200)
	0-<60m	47.4 (25.3–92.6)	122,500 (65,500–239,400)	2.7 (1.2–5.8)	7,000 (3,200–15,000)
Solomon Islands	0-<12m	87.0 (50.3–163.7)	1,800 (1,100–3,400)	23.1 (10.6–51.6)	500 (200–1,100)
	0-<60m	42.3 (24.4–79.5)	4,300 (2,500–8,100)	5.9 (2.6–12.4)	600 (300–1,300)
Sri Lanka	0-<12m	93.7 (50.8–173.9)	31,600 (17,100–58,600)	50.3 (23.5–108.4)	17,000 (7,900–36,500)
	0-<60m	45.5 (24.7–84.4)	76,300 (41,400–141,600)	15.7 (7.2–33.3)	26,300 (12,000–55,800)
São Tomé and Príncipe	0-<12m	84.7 (49.2–150.7)	500 (300–900)	28.7 (13.5–62.1)	200 (80–400)
	0-<60m	41.1 (23.9–73.2)	1,200 (700–2,200)	8.0 (3.8–17.1)	200 (100–500)
Tanzania	0-<12m	90.4 (49.2–165.6)	181,500 (98,800–332,600)	11.7 (5.3–25.3)	23,400 (10,700–50,700)

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	0-<60m	43.9 (23.9–80.4)	418,200 (227,600–766,200)	2.3 (1.1–5.2)	21,800 (10,200–49,800)
Timor-Leste	0-<12m	116.3 (57.9–233.7)	4,500 (2,300–9,100)	25.9 (10.5–62.8)	1,000 (400–2,500)
	0-<60m	56.5 (28.1–113.5)	9,800 (4,900–19,700)	6.2 (2.6–15.1)	1,100 (400–2,600)
Tunisia	0-<12m	113.7 (54.2–241.4)	21,600 (10,300–45,900)	42.4 (17.9–105.9)	8,100 (3,400–20,100)
	0-<60m	55.2 (26.3–117.2)	56,300 (26,800–119,400)	12.1 (5.1–27.4)	12,300 (5,200–27,900)
Ukraine	0-<12m	105.3 (52.0–221.5)	40,000 (19,800–84,200)	66.2 (26.7–153.1)	25,200 (10,200–58,200)
	0-<60m	51.1 (25.3–107.5)	111,700 (55,200–234,900)	21.4 (9.5–50.4)	46,800 (20,800–110,100)
Uzbekistan	0-<12m	91.1 (50.0–170.5)	62,600 (34,400–117,300)	44.7 (20.0–106.8)	30,700 (13,700–73,500)
	0-<60m	44.2 (24.3–82.8)	151,900 (83,300–284,400)	13.7 (6.4–30.5)	46,900 (21,900–104,700)
Vanuatu	0-<12m	88.9 (46.6–162.1)	800 (400–1,500)	24.6 (11.2–54.0)	200 (100–500)
	0-<60m	43.2 (22.6–78.7)	1,800 (900–3,200)	6.5 (2.8–13.8)	300 (100–600)
Viet Nam	0-<12m	109.0 (53.2–227.3)	174,200 (85,000–363,400)	36.9 (15.5–82.7)	59,000 (24,800–132,200)
	0-<60m	52.9 (25.8–110.4)	417,500 (203,700–870,700)	9.9 (4.3–22.6)	78,500 (33,900–178,200)
West Bank and Gaza	0-<12m	105.2 (55.8–209.8)	14,200 (7,500–28,300)	45.3 (19.6–98.4)	6,100 (2,600–13,300)
	0-<60m	51.1 (27.1–101.9)	35,200 (18,700–70,300)	13.0 (5.9–30.1)	9,000 (4,000–20,800)
Zambia	0-<12m	93.1 (52.2–159.3)	55,200 (31,000–94,400)	18.1 (9.0–37.1)	10,800 (5,300–22,000)
	0-<60m	45.2 (25.4–77.3)	131,200 (73,600–224,300)	4.2 (1.9–8.7)	12,000 (5,500–25,300)
Zimbabwe	0-<12m	117.6	45,800	20.1	7,800

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		(62.0–217.8)	(24,100–84,700)	(9.3–46.2)	(3,600–18,000)
	0-<60m	57.1 (30.1–105.8)	122,200 (64,400–226,200)	4.4 (2.0–9.8)	9,400 (4,300–21,000)
Upper-middle-income					
Albania	0-<12m	90.5 (35.4–241.6)	3,000 (1,200–8,000)	13.6 (5.6–32.8)	400 (200–1,100)
	0-<60m	46.5 (18.2–124.0)	7,900 (3,100–21,000)	4.2 (1.5–10.5)	700 (300–1,800)
American Samoa	0-<12m	95.7 (36.4–267.9)	100 (40–300)	10.7 (4.3–26.5)	10 (4–30)
	0-<60m	49.1 (18.7–137.5)	200 (90–700)	3.0 (1.1–7.6)	20 (6–40)
Argentina	0-<12m	101.4 (39.2–267.5)	75,600 (29,200–199,300)	13.9 (5.7–36.2)	10,300 (4,300–27,000)
	0-<60m	52.1 (20.1–137.3)	194,900 (75,200–513,900)	4.2 (1.6–10.7)	15,700 (5,800–39,900)
Armenia	0-<12m	106.6 (39.8–279.3)	4,300 (1,600–11,200)	14.9 (6.1–37.8)	600 (200–1,500)
	0-<60m	54.7 (20.4–143.4)	11,400 (4,300–30,000)	4.5 (1.7–11.7)	900 (400–2,500)
Azerbaijan	0-<12m	111.8 (42.0–322.1)	17,000 (6,400–49,000)	13.0 (4.9–33.6)	2,000 (800–5,100)
	0-<60m	57.4 (21.6–165.4)	48,700 (18,300–140,200)	3.8 (1.4–9.8)	3,200 (1,100–8,300)
Belarus	0-<12m	102.6 (38.7–288.8)	9,500 (3,600–26,900)	25.7 (10.4–67.7)	2,400 (1,000–6,300)
	0-<60m	52.6 (19.8–148.2)	29,300 (11,000–82,400)	8.6 (3.2–22.4)	4,800 (1,800–12,400)
Belize	0-<12m	103.7 (36.7–273.5)	800 (300–2,200)	9.9 (4.1–25.2)	80 (30–200)
	0-<60m	53.2 (18.9–140.4)	2,100 (800–5,600)	2.6 (1.0–7.5)	100 (40–300)
Bosnia and Herzegovina	0-<12m	104.2 (40.1–295.4)	2,600 (1,000–7,400)	17.9 (7.3–46.0)	400 (200–1,200)
	0-<60m	53.5	7,300	5.6	800

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		(20.6–151.6)	(2,800–20,800)	(2.4–14.7)	(300–2,000)
Botswana	0-<12m	156.8 (59.0–429.3)	8,500 (3,200–23,200)	9.5 (3.8–23.6)	500 (200–1,300)
	0-<60m	80.5 (30.3–220.4)	22,000 (8,300–60,200)	2.2 (0.8–6.1)	600 (200–1,700)
Brazil	0-<12m	105.6 (38.5–271.8)	307,700 (112,100–791,700)	12.0 (4.8–29.4)	34,900 (14,100–85,700)
	0-<60m	54.2 (19.8–139.5)	790,200 (287,800–2,033,000)	3.5 (1.3–8.3)	50,400 (18,400–120,800)
Bulgaria	0-<12m	105.2 (39.6–297.2)	6,600 (2,500–18,700)	19.5 (8.3–50.5)	1,200 (500–3,200)
	0-<60m	54.0 (20.3–152.6)	17,000 (6,400–48,100)	6.6 (2.6–16.2)	2,100 (800–5,100)
China	0-<12m	102.7 (44.3–231.0)	1,717,600 (740,300–3,862,000)	15.9 (7.6–30.8)	265,600 (126,700–515,700)
	0-<60m	52.7 (22.7–118.6)	4,558,600 (1,964,800–10,249,800)	4.9 (2.2–10.1)	421,100 (191,900–871,000)
Colombia	0-<12m	101.4 (38.7–262.6)	77,100 (29,400–199,600)	10.7 (4.5–25.9)	8,100 (3,400–19,700)
	0-<60m	52.1 (19.9–134.8)	194,200 (74,200–502,900)	3.0 (1.1–7.4)	11,200 (4,300–27,600)
Costa Rica	0-<12m	104.5 (37.1–291.2)	7,100 (2,500–19,800)	13.8 (5.5–38.0)	900 (400–2,600)
	0-<60m	53.7 (19.0–149.5)	18,800 (6,700–52,500)	4.1 (1.5–10.8)	1,400 (500–3,800)
Cuba	0-<12m	98.8 (37.8–250.4)	10,500 (4,000–26,500)	16.8 (7.1–40.0)	1,800 (800–4,200)
	0-<60m	50.7 (19.4–128.6)	29,800 (11,400–75,500)	5.4 (2.2–12.8)	3,100 (1,300–7,500)
Dominica	0-<12m	106.8 (43.4–288.8)	100 (40–300)	8.8 (3.2–22.3)	9 (3–20)
	0-<60m	54.8 (22.3–148.3)	300 (100–700)	2.2 (0.8–5.8)	10 (4–30)
Dominican Republic	0-<12m	117.5 (44.5–333.4)	23,700 (9,000–67,400)	7.6 (3.1–19.0)	1,500 (600–3,800)

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	0-<60m	60.3 (22.8–171.2)	60,700 (23,000–172,400)	1.8 (0.6–5.0)	1,800 (600–5,000)
Ecuador	0-<12m	104.1 (40.0–275.4)	35,100 (13,500–92,800)	11.5 (4.8–27.9)	3,900 (1,600–9,400)
	0-<60m	53.4 (20.5–141.4)	88,800 (34,200–235,100)	3.2 (1.3–7.8)	5,300 (2,100–12,900)
Equatorial Guinea	0-<12m	109.4 (41.9–292.6)	4,500 (1,700–12,000)	4.1 (1.6–11.2)	200 (60–500)
	0-<60m	56.2 (21.5–150.2)	11,000 (4,200–29,300)	0.8 (0.3–2.5)	200 (60–500)
Fiji	0-<12m	92.3 (34.2–248.9)	1,700 (600–4,500)	8.6 (3.5–20.3)	200 (60–400)
	0-<60m	47.4 (17.6–127.8)	4,300 (1,600–11,500)	2.3 (0.8–5.9)	200 (70–500)
Gabon	0-<12m	109.0 (42.0–293.1)	7,200 (2,800–19,300)	6.7 (2.8–18.5)	400 (200–1,200)
	0-<60m	55.9 (21.6–150.5)	17,700 (6,800–47,500)	1.6 (0.6–4.1)	500 (200–1,300)
Georgia	0-<12m	102.3 (38.3–293.6)	5,100 (1,900–14,700)	16.4 (6.8–40.8)	800 (300–2,000)
	0-<60m	52.5 (19.7–150.7)	14,400 (5,400–41,300)	5.1 (1.9–13.9)	1,400 (500–3,800)
Grenada	0-<12m	106.0 (39.2–283.0)	200 (80–600)	11.0 (4.3–27.6)	20 (9–60)
	0-<60m	54.4 (20.1–145.3)	500 (200–1,500)	3.0 (1.1–8.3)	30 (10–80)
Guatemala	0-<12m	96.8 (39.4–249.2)	40,600 (16,600–104,700)	6.4 (2.4–15.5)	2,700 (1,000–6,500)
	0-<60m	49.7 (20.2–127.9)	102,200 (41,600–263,100)	1.5 (0.5–3.7)	3,100 (1,100–7,500)
Guyana	0-<12m	113.9 (43.8–313.3)	1,700 (700–4,700)	8.8 (3.6–23.5)	100 (50–400)
	0-<60m	58.5 (22.5–160.8)	4,400 (1,700–12,100)	2.3 (0.9–5.9)	200 (70–400)
Indonesia	0-<12m	104.4	477,900	7.6	35,000

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
		(41.1–259.7)	(187,900–1,188,400)	(3.0–18.6)	(13,700–85,300)
	0-<60m	53.6 (21.1–133.3)	1,283,600 (504,500–3,191,600)	1.9 (0.7–4.6)	45,100 (16,000–110,900)
Iran, Islamic Rep.	0-<12m	104.6 (40.4–276.2)	166,300 (64,200–439,200)	12.0 (5.1–30.2)	19,100 (8,100–48,100)
	0-<60m	53.7 (20.7–141.8)	407,000 (157,200–1,074,900)	3.4 (1.4–8.4)	25,800 (10,900–64,000)
Iraq	0-<12m	117.1 (42.1–311.7)	122,100 (43,900–325,100)	9.0 (3.4–21.6)	9,400 (3,600–22,500)
	0-<60m	60.1 (21.6–160.0)	322,900 (116,100–859,900)	2.2 (0.8–6.0)	12,000 (4,400–32,200)
Jamaica	0-<12m	109.8 (38.6–294.0)	4,900 (1,700–13,200)	7.9 (3.2–18.9)	400 (100–800)
	0-<60m	56.4 (19.8–150.9)	13,100 (4,600–35,200)	2.0 (0.7–4.9)	500 (200–1,200)
Jordan	0-<12m	121.1 (46.0–336.5)	24,500 (9,300–68,000)	13.8 (5.5–37.2)	2,800 (1,100–7,500)
	0-<60m	62.2 (23.6–172.7)	67,600 (25,700–187,900)	3.9 (1.4–11.3)	4,200 (1,600–12,300)
Kazakhstan	0-<12m	93.8 (35.1–262.7)	34,200 (12,800–95,900)	15.7 (6.6–39.5)	5,700 (2,400–14,400)
	0-<60m	48.2 (18.0–134.8)	93,800 (35,100–262,500)	4.9 (1.9–12.7)	9,600 (3,800–24,700)
Kosovo	0-<12m	102.4 (38.1–291.8)	2,300 (800–6,400)	16.0 (6.2–39.9)	400 (100–900)
	0-<60m	52.6 (19.5–149.8)	6,000 (2,200–17,100)	5.0 (1.8–12.8)	600 (200–1,500)
Lebanon	0-<12m	122.7 (43.0–348.3)	13,900 (4,900–39,400)	15.0 (5.7–39.5)	1,700 (600–4,500)
	0-<60m	63.0 (22.1–178.8)	37,300 (13,100–105,800)	4.4 (1.5–11.8)	2,600 (900–7,000)
Libya	0-<12m	114.6 (41.4–309.2)	13,600 (4,900–36,800)	14.4 (6.0–42.3)	1,700 (700–5,000)
	0-<60m	58.8 (21.2–158.7)	37,300 (13,500–100,600)	4.4 (1.6–11.5)	2,800 (1,000–7,300)

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
Malaysia	0-<12m	97.7 (39.1–247.4)	52,300 (20,900–132,400)	13.7 (5.5–33.4)	7,300 (3,000–17,900)
	0-<60m	50.2 (20.1–127.0)	131,500 (52,600–332,800)	4.2 (1.6–11.2)	11,000 (4,200–29,300)
Maldives	0-<12m	84.1 (35.6–207.2)	600 (200–1,500)	12.4 (5.6–28.6)	90 (40–200)
	0-<60m	43.2 (18.3–106.3)	1,600 (700–3,900)	3.8 (1.6–9.1)	100 (60–300)
Marshall Islands	0-<12m	94.8 (37.7–249.8)	90 (40–200)	6.9 (2.8–16.3)	7 (3–20)
	0-<60m	48.7 (19.3–128.2)	200 (100–600)	1.7 (0.6–4.0)	8 (3–20)
Mexico	0-<12m	102.4 (39.5–272.2)	222,000 (85,500–589,900)	11.3 (4.5–26.4)	24,400 (9,800–57,300)
	0-<60m	52.6 (20.3–139.7)	580,600 (223,800–1,542,900)	3.1 (1.2–8.2)	34,600 (13,000–90,100)
Montenegro	0-<12m	105.5 (40.6–286.6)	800 (300–2,300)	22.1 (9.0–57.9)	200 (70–500)
	0-<60m	54.2 (20.8–147.1)	2,000 (800–5,300)	7.3 (2.8–19.5)	300 (100–700)
Namibia	0-<12m	119.6 (44.3–326.5)	8,000 (3,000–21,900)	6.5 (2.6–16.0)	400 (200–1,100)
	0-<60m	61.4 (22.7–167.6)	20,500 (7,600–56,000)	1.5 (0.6–3.6)	500 (200–1,200)
North Macedonia	0-<12m	102.5 (36.9–281.8)	2,300 (800–6,200)	18.3 (7.0–47.3)	400 (200–1,000)
	0-<60m	52.6 (19.0–144.7)	6,000 (2,200–16,500)	6.0 (2.2–14.8)	700 (300–1,700)
Paraguay	0-<12m	101.2 (38.0–279.9)	14,400 (5,400–39,700)	9.1 (3.8–22.8)	1,300 (500–3,200)
	0-<60m	51.9 (19.5–143.7)	36,300 (13,600–100,400)	2.4 (0.9–6.3)	1,700 (600–4,400)
Peru	0-<12m	82.9 (33.5–214.8)	50,400 (20,400–130,600)	8.5 (3.6–20.8)	5,100 (2,200–12,600)
	0-<60m	42.6	119,600	2.3	6,600

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
		(17.2–110.3)	(48,400–309,800)	(1.0–5.7)	(2,700–16,000)
Russian Federation	0-<12m	103.6 (39.7–279.5)	186,500 (71,500–503,200)	19.7 (8.1–46.5)	35,500 (14,600–83,700)
	0-<60m	53.2 (20.4–143.5)	5e+05 (191,700–1,349,100)	6.4 (2.5–15.7)	60,200 (23,900–147,400)
Samoa	0-<12m	80.8 (33.6–207.9)	500 (200–1,200)	7.1 (3.0–16.6)	40 (20–100)
	0-<60m	41.5 (17.3–106.7)	1,100 (500–2,900)	1.9 (0.8–4.7)	50 (20–100)
Serbia	0-<12m	103.0 (38.2–307.4)	8,900 (3,300–26,400)	18.1 (7.7–42.8)	1,600 (700–3,700)
	0-<60m	52.9 (19.6–157.8)	22,400 (8,300–66,800)	5.9 (2.3–14.6)	2,500 (1,000–6,200)
South Africa	0-<12m	145.8 (56.0–366.0)	164,400 (63,200–412,900)	10.2 (4.3–27.0)	11,500 (4,900–30,400)
	0-<60m	74.8 (28.7–187.9)	433,000 (166,400–1,087,300)	2.5 (1.0–6.4)	14,700 (5,700–37,200)
St. Lucia	0-<12m	123.3 (41.6–338.8)	200 (80–700)	11.5 (4.2–30.1)	20 (8–60)
	0-<60m	63.3 (21.3–173.9)	600 (200–1,700)	3.1 (1.1–8.6)	30 (10–90)
St. Vincent and the Grenadines	0-<12m	105.7 (41.2–287.2)	100 (40–300)	12.8 (5.2–31.1)	10 (5–30)
	0-<60m	54.2 (21.2–147.4)	500 (200–1,300)	3.6 (1.3–9.6)	30 (10–90)
Suriname	0-<12m	114.4 (43.5–329.3)	1,100 (400–3,300)	10.9 (4.4–27.7)	100 (40–300)
	0-<60m	58.7 (22.3–169.0)	3,100 (1,200–9,000)	2.8 (1.0–7.5)	100 (50–400)
Thailand	0-<12m	110.3 (41.0–302.4)	78,400 (29,200–215,000)	13.1 (5.4–33.5)	9,300 (3,800–23,800)
	0-<60m	56.6 (21.1–155.3)	206,500 (76,900–566,400)	3.9 (1.4–9.5)	14,100 (5,000–34,800)
Tonga	0-<12m	96.2 (36.6–246.8)	200 (70–500)	11.4 (4.9–29.7)	20 (10–60)

Country	Age	Incidence in the community		Hospital admission	
		Incidence rate (per 1,000 person-years)	Number of episodes (per year)	Hospital admission rate (per 1,000 person-years)	Number of admissions (per year)
	0-<60m	49.4 (18.8–126.7)	500 (200–1,400)	3.3 (1.3–8.4)	40 (10–90)
Turkmenistan	0-<12m	87.5 (34.9–227.4)	10,700 (4,300–27,700)	8.9 (3.8–22.3)	1,100 (500–2,700)
	0-<60m	44.9 (17.9–116.7)	30,300 (12,100–78,800)	2.5 (0.9–6.6)	1,700 (600–4,400)
Tuvalu	0-<12m	93.9 (36.8–251.6)	20 (9–60)	8.3 (3.5–20.6)	2 (1–5)
	0-<60m	48.2 (18.9–129.2)	60 (20–200)	2.1 (0.9–5.7)	3 (1–7)
Türkiye	0-<12m	98.6 (39.3–261.7)	126,600 (50,400–336,100)	13.7 (5.7–33.8)	17,600 (7,300–43,500)
	0-<60m	50.6 (20.2–134.4)	337,000 (134,200–894,500)	4.1 (1.6–10.6)	27,200 (10,400–70,400)
Venezuela, RB	0-<12m	104.0 (38.1–263.2)	43,600 (15,900–110,300)	7.6 (3.0–18.2)	3,200 (1,200–7,600)
	0-<60m	53.4 (19.5–135.1)	129,100 (47,300–326,800)	1.8 (0.7–4.9)	4,400 (1,700–11,800)

377 RSV = respiratory syncytial virus. ALRI = acute lower respiratory infection.

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Table 2. Country-specific estimates of RSV-attributable and RSV-associated mortality, by age group.

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
Lower-income					
Afghanistan	0-<12m	70.6 (36.5–142.9)	800 (400–1,700)	161.7 (94.7–284.4)	1,900 (1,100–3,300)
	0-<60m	23.2 (12.0–47.0)	1,300 (700–2,700)	53.4 (30.9–95.5)	3,000 (1,700–5,400)
Burkina Faso	0-<12m	105.3 (51.7–222.0)	800 (400–1,600)	241.4 (132.2–448.9)	1,700 (900–3,200)
	0-<60m	35.4 (17.3–74.9)	1,200 (600–2,600)	81.6 (44.0–154.5)	2,800 (1,500–5,300)
Burundi	0-<12m	64.9 (31.6–128.2)	300 (100–500)	149.3 (83.4–256.4)	600 (300–1,100)
	0-<60m	21.4 (10.4–42.4)	400 (200–900)	49.5 (27.3–86.4)	1,000 (600–1,700)
Central African Republic	0-<12m	147.5 (71.7–305.6)	200 (100–500)	336.5 (180.1–624.6)	500 (300–900)
	0-<60m	48.6 (23.6–101.3)	400 (200–700)	111.7 (58.9–211.1)	800 (400–1,500)
Chad	0-<12m	148.2 (67.2–330.8)	900 (400–2,000)	337.8 (169.8–668.5)	2,100 (1,000–4,100)
	0-<60m	50.5 (22.8–113.3)	1,400 (700–3,300)	115.8 (57.3–233.9)	3,300 (1,600–6,700)
Congo, Dem. Rep.	0-<12m	107.6 (51.4–221.7)	3,500 (1,700–7,300)	245.0 (131.5–446.0)	8,000 (4,300–14,600)
	0-<60m	36.3 (17.3–75.2)	5,600 (2,700–11,700)	83.3 (44.0–154.3)	12,900 (6,800–23,900)
Eritrea	0-<12m	55.5 (26.2–107.9)	60 (30–100)	126.3 (70.6–210.4)	100 (70–200)
	0-<60m	17.0 (8.0–33.2)	80 (40–200)	38.9 (21.5–65.8)	200 (100–300)
Ethiopia	0-<12m	57.9 (30.2–113.3)	2,000 (1,000–3,900)	132.6 (78.9–224.8)	4,600 (2,700–7,700)
	0-<60m	19.2 (10.0–37.7)	3,200 (1,700–6,200)	44.3 (26.0–76.2)	7,300 (4,300–12,600)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
Gambia, The	0-<12m	58.9 (28.4–120.9)	50 (20–100)	135.1 (75.5–238.2)	100 (60–200)
	0-<60m	19.9 (9.6–40.9)	80 (40–200)	45.9 (25.3–82.2)	200 (100–300)
Guinea	0-<12m	121.5 (57.4–263.1)	500 (200–1,100)	278.0 (146.1–531.8)	1,200 (600–2,300)
	0-<60m	41.0 (19.3–89.3)	800 (400–1,800)	94.4 (48.9–184.2)	1,900 (1,000–3,800)
Guinea-Bissau	0-<12m	98.0 (46.8–200.5)	60 (30–100)	223.7 (120.6–402.7)	100 (70–200)
	0-<60m	32.4 (15.4–66.4)	100 (50–200)	74.4 (39.5–136.1)	200 (100–400)
Haiti	0-<12m	76.6 (38.8–152.0)	200 (100–400)	175.0 (100.6–303.5)	400 (300–800)
	0-<60m	24.7 (12.5–49.1)	300 (200–600)	56.7 (32.1–99.9)	700 (400–1,300)
Korea, Dem. Rep.	0-<12m	20.6 (9.6–40.2)	70 (30–100)	47.3 (26.6–77.7)	200 (90–300)
	0-<60m	6.1 (2.8–11.9)	100 (50–200)	14.0 (7.8–23.3)	200 (100–400)
Liberia	0-<12m	104.3 (53.4–210.6)	200 (80–300)	238.4 (135.7–426.7)	400 (200–600)
	0-<60m	34.7 (17.7–70.2)	300 (100–500)	79.7 (44.8–145.1)	600 (300–1,100)
Madagascar	0-<12m	57.9 (30.2–115.8)	500 (300–1,000)	131.9 (78.6–227.8)	1,100 (700–1,900)
	0-<60m	19.5 (10.2–39.2)	800 (400–1,600)	44.8 (26.4–78.5)	1,800 (1,100–3,200)
Malawi	0-<12m	57.2 (28.9–118.7)	300 (200–700)	131.2 (77.1–230.1)	800 (500–1,400)
	0-<60m	17.0 (8.6–35.5)	500 (200–1,000)	39.3 (22.8–70.0)	1,100 (700–2,000)
Mali	0-<12m	119.0 (56.4–244.5)	900 (400–1,800)	271.7 (143.8–496.1)	2,000 (1,100–3,700)
	0-<60m	40.3 (19.1–83.1)	1,400 (700–2,900)	92.6 (48.2–172.0)	3,300 (1,700–6,100)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
Mozambique	0-<12m	89.3 (43.9–175.5)	1,000 (500–1,900)	204.3 (113.3–355.1)	2,200 (1,200–3,800)
	0-<60m	30.1 (14.8–59.3)	1,500 (700–3,000)	69.2 (37.8–122.2)	3,500 (1,900–6,200)
Niger	0-<12m	98.6 (48.9–200.1)	1,000 (500–2,000)	224.7 (124.7–402.2)	2,200 (1,200–4,000)
	0-<60m	33.9 (16.8–69.1)	1,600 (800–3,200)	77.8 (42.6–141.6)	3,600 (2,000–6,600)
Rwanda	0-<12m	44.2 (22.2–90.2)	200 (90–400)	101.1 (59.5–173.5)	400 (200–700)
	0-<60m	13.7 (6.8–28.0)	300 (100–500)	31.4 (18.3–54.7)	600 (300–1,000)
Sierra Leone	0-<12m	139.7 (69.9–290.7)	300 (200–700)	319.4 (175.5–595.0)	800 (400–1,400)
	0-<60m	46.5 (23.2–97.2)	500 (300–1,100)	106.9 (57.9–202.8)	1,200 (700–2,300)
Somalia	0-<12m	152.1 (72.8–322.5)	900 (400–1,900)	346.4 (182.2–657.2)	2,100 (1,100–3,900)
	0-<60m	52.8 (25.2–112.4)	1,400 (700–3,100)	120.9 (62.6–233.8)	3,300 (1,700–6,400)
South Sudan	0-<12m	126.0 (61.5–271.7)	400 (200–1,000)	287.8 (155.9–547.7)	1,000 (600–1,900)
	0-<60m	42.0 (20.4–90.9)	700 (300–1,500)	96.5 (51.5–187.2)	1,600 (900–3,200)
Sudan	0-<12m	67.6 (32.7–136.6)	900 (400–1,800)	154.9 (86.2–271.8)	2,000 (1,100–3,500)
	0-<60m	22.5 (10.9–45.5)	1,400 (700–2,800)	51.8 (28.4–92.3)	3,200 (1,800–5,800)
Syrian Arab Republic	0-<12m	27.6 (13.8–56.5)	100 (60–200)	63.7 (37.9–108.5)	300 (200–400)
	0-<60m	8.8 (4.4–18.0)	200 (80–300)	20.3 (12.0–35.1)	400 (200–600)
Tajikistan	0-<12m	45.6 (22.5–88.2)	100 (60–200)	104.0 (60.5–171.2)	300 (200–500)
	0-<60m	13.4 (6.6–26.0)	200 (90–300)	30.7 (17.6–51.2)	400 (200–700)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
Togo	0-<12m	79.6 (41.4–156.3)	200 (100–400)	182.3 (106.6–314.8)	500 (300–800)
	0-<60m	26.4 (13.7–52.0)	300 (200–600)	60.8 (35.1–106.7)	700 (400–1,300)
Uganda	0-<12m	49.8 (25.0–100.2)	800 (400–1,600)	114.9 (66.7–198.2)	1,800 (1,100–3,200)
	0-<60m	16.5 (8.3–33.2)	1,300 (600–2,600)	38.2 (21.9–66.9)	2,900 (1,700–5,100)
Yemen, Rep.	0-<12m	70.1 (34.1–143.1)	600 (300–1,200)	160.1 (89.4–282.8)	1,300 (700–2,300)
	0-<60m	22.5 (10.9–46.1)	900 (400–1,900)	51.7 (28.5–92.9)	2,100 (1,200–3,800)
Lower-middle-income					
Algeria	0-<12m	29.1 (14.0–57.4)	300 (100–600)	66.5 (38.3–110.3)	700 (400–1,100)
	0-<60m	8.5 (4.1–16.8)	400 (200–800)	19.6 (11.2–32.9)	1,000 (600–1,700)
Angola	0-<12m	91.8 (43.1–192.5)	1,100 (500–2,300)	209.9 (112.0–384.4)	2,500 (1,300–4,600)
	0-<60m	30.6 (14.4–64.5)	1,700 (800–3,700)	70.5 (37.0–131.3)	4,000 (2,100–7,400)
Bangladesh	0-<12m	40.2 (20.6–76.3)	1,200 (600–2,200)	92.1 (55.3–149.1)	2,600 (1,600–4,300)
	0-<60m	11.6 (5.9–22.0)	1,700 (900–3,200)	26.7 (15.8–43.8)	3,800 (2,300–6,300)
Benin	0-<12m	111.2 (53.5–228.1)	400 (200–900)	254.6 (136.8–463.5)	1,000 (500–1,800)
	0-<60m	37.4 (17.9–76.9)	700 (300–1,400)	86.1 (45.6–159.4)	1,600 (900–3,000)
Bhutan	0-<12m	37.1 (18.5–73.1)	5 (2–9)	84.5 (49.9–140.4)	10 (6–20)
	0-<60m	11.1 (5.5–21.9)	7 (3–10)	25.4 (14.8–42.7)	20 (9–30)
Bolivia	0-<12m	33.7 (16.1–68.5)	80 (40–200)	77.5 (44.4–131.5)	200 (100–300)
	0-<60m	9.7	100	22.5	300

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
		(4.7–19.8)	(60–200)	(12.7–38.7)	(200–500)
Cabo Verde	0-<12m	18.3 (8.4–39.9)	2 (1–4)	42.3 (23.6–75.4)	4 (2–8)
	0-<60m	4.4 (2.0–9.7)	2 (1–5)	10.3 (5.7–18.5)	5 (3–10)
Cambodia	0-<12m	34.1 (17.4–69.5)	100 (60–200)	78.4 (47.1–133.6)	300 (200–500)
	0-<60m	9.8 (5.0–20.0)	200 (90–400)	22.6 (13.4–39.1)	400 (200–700)
Cameroon	0-<12m	92.5 (44.6–182.7)	800 (400–1,500)	211.2 (115.2–368.6)	1,800 (1,000–3,100)
	0-<60m	30.7 (14.8–60.7)	1,200 (600–2,500)	70.5 (37.9–124.9)	2,900 (1,500–5,100)
Comoros	0-<12m	75.8 (37.3–155.0)	20 (9–40)	173.5 (97.2–308.4)	40 (20–80)
	0-<60m	24.6 (12.1–50.5)	30 (10–60)	56.7 (31.3–102.4)	70 (40–100)
Congo, Rep.	0-<12m	55.1 (27.8–109.0)	90 (50–200)	126.2 (73.3–215.4)	200 (100–400)
	0-<60m	17.8 (9.0–35.4)	100 (70–300)	41.1 (23.6–71.2)	300 (200–600)
Côte d'Ivoire	0-<12m	99.2 (46.8–189.2)	800 (400–1,600)	225.9 (120.5–384.2)	1,900 (1,000–3,300)
	0-<60m	33.5 (15.8–64.1)	1,400 (600–2,600)	76.8 (40.3–132.6)	3,100 (1,600–5,400)
Djibouti	0-<12m	72.2 (34.8–136.1)	10 (7–30)	164.2 (91.1–272.2)	30 (20–50)
	0-<60m	21.9 (10.6–41.4)	20 (10–40)	50.2 (27.4–84.4)	50 (30–80)
Egypt, Arab Rep.	0-<12m	26.8 (13.1–55.0)	600 (300–1,300)	61.4 (35.8–104.7)	1,500 (900–2,500)
	0-<60m	7.3 (3.6–15.0)	900 (500–1,900)	16.8 (9.7–29.0)	2,100 (1,200–3,700)
El Salvador	0-<12m	15.4 (7.4–31.8)	20 (9–40)	35.5 (20.4–61.0)	40 (20–70)
	0-<60m	4.0	20	9.3	50

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
		(1.9–8.3)	(10–50)	(5.3–16.0)	(30–90)
Eswatini	0-<12m	55.0 (25.7–109.8)	20 (8–30)	125.7 (68.6–216.4)	40 (20–60)
	0-<60m	18.3 (8.5–36.6)	30 (10–50)	42.1 (22.6–73.5)	60 (30–100)
Ghana	0-<12m	52.1 (26.8–100.9)	400 (200–800)	119.8 (70.8–200.7)	1,000 (600–1,700)
	0-<60m	16.9 (8.7–32.8)	700 (400–1,400)	39.0 (22.8–66.3)	1,600 (900–2,700)
Honduras	0-<12m	19.7 (9.9–42.9)	40 (20–90)	45.4 (27.0–81.0)	90 (60–200)
	0-<60m	5.9 (3.0–12.9)	60 (30–100)	13.6 (8.0–24.6)	100 (80–200)
India	0-<12m	43.6 (23.3–89.6)	10,400 (5,600–21,400)	100.6 (62.3–173.6)	24,100 (14,900–41,500)
	0-<60m	12.9 (6.9–26.6)	15,100 (8,100–31,100)	29.9 (18.3–52.4)	35,000 (21,400–61,200)
Kenya	0-<12m	49.6 (24.2–98.8)	700 (300–1,400)	113.7 (64.8–194.2)	1,600 (900–2,700)
	0-<60m	15.8 (7.7–31.6)	1,100 (500–2,200)	36.5 (20.5–63.2)	2,600 (1,400–4,400)
Kiribati	0-<12m	60.9 (30.1–121.7)	2 (1–4)	139.6 (79.6–240.7)	4 (2–7)
	0-<60m	19.5 (9.6–38.9)	3 (1–6)	44.9 (25.2–78.5)	7 (4–10)
Kyrgyz Republic	0-<12m	24.1 (11.8–50.2)	30 (20–70)	55.5 (32.4–95.6)	80 (50–100)
	0-<60m	6.3 (3.1–13.2)	50 (20–100)	14.6 (8.4–25.5)	100 (70–200)
Lao PDR	0-<12m	50.8 (24.6–102.2)	80 (40–200)	116.5 (65.7–200.8)	200 (100–300)
	0-<60m	16.6 (8.1–33.5)	100 (60–300)	38.4 (21.4–67.1)	300 (200–500)
Lesotho	0-<12m	106.0 (53.3–232.3)	60 (30–100)	242.4 (135.7–464.5)	100 (70–300)
	0-<60m	36.2	90	83.2	200

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
		(18.2–79.6)	(50–200)	(45.9–162.5)	(100–400)
Mauritania	0-<12m	89.4 (43.4–180.0)	100 (60–300)	204.1 (112.2–361.2)	300 (200–500)
	0-<60m	29.7 (14.4–59.9)	200 (100–400)	68.2 (36.9–122.6)	500 (300–800)
Micronesia, Fed. Sts.	0-<12m	32.3 (15.3–60.2)	1 (0–2)	73.8 (41.9–117.8)	2 (1–4)
	0-<60m	12.7 (6.0–23.8)	1 (1–3)	29.3 (16.4–47.3)	3 (2–5)
Moldova	0-<12m	17.9 (8.4–38.7)	7 (3–10)	41.2 (23.4–73.2)	20 (9–30)
	0-<60m	4.2 (2.0–9.2)	9 (4–20)	9.8 (5.5–17.5)	20 (10–40)
Mongolia	0-<12m	19.7 (8.7–40.3)	10 (6–30)	45.2 (24.5–76.9)	30 (20–60)
	0-<60m	4.8 (2.1–9.8)	20 (8–40)	11.1 (6.0–19.0)	40 (20–70)
Morocco	0-<12m	28.5 (14.3–56.1)	200 (90–400)	65.0 (38.9–107.8)	400 (200–700)
	0-<60m	7.8 (3.9–15.3)	300 (100–500)	17.8 (10.6–29.9)	600 (400–1,000)
Myanmar	0-<12m	50.1 (26.1–94.8)	500 (200–900)	114.5 (68.5–188.1)	1,100 (600–1,700)
	0-<60m	16.5 (8.6–31.3)	700 (400–1,400)	37.9 (22.4–63.2)	1,700 (1,000–2,800)
Nepal	0-<12m	41.3 (20.9–79.6)	200 (100–400)	94.3 (56.2–154.6)	500 (300–800)
	0-<60m	12.0 (6.1–23.2)	300 (200–600)	27.6 (16.2–45.8)	700 (400–1,200)
Nicaragua	0-<12m	19.9 (9.7–40.6)	30 (10–50)	45.9 (26.7–78.0)	60 (40–100)
	0-<60m	5.7 (2.8–11.6)	40 (20–80)	13.2 (7.6–22.7)	90 (50–200)
Nigeria	0-<12m	157.9 (68.3–321.1)	11,000 (4,800–22,500)	358.3 (172.5–656.3)	25,100 (12,100–45,900)
	0-<60m	52.9	17,700	120.8	40,400

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
		(22.8–108.0)	(7,600–36,100)	(57.2–225.3)	(19,100–75,300)
Pakistan	0-<12m	80.2 (38.8–166.0)	4,600 (2,200–9,600)	183.3 (100.9–330.3)	10,600 (5,800–19,100)
	0-<60m	26.7 (12.9–55.5)	7,400 (3,600–15,400)	61.5 (33.4–112.7)	17,000 (9,200–31,200)
Papua New Guinea	0-<12m	49.8 (26.1–102.6)	100 (60–200)	114.4 (68.9–200.9)	300 (200–500)
	0-<60m	16.4 (8.6–33.8)	200 (90–400)	37.9 (22.6–67.6)	400 (200–700)
Philippines	0-<12m	38.4 (18.8–74.5)	800 (400–1,500)	87.8 (51.2–144.2)	1,700 (1,000–2,900)
	0-<60m	10.2 (5.0–19.9)	1,100 (500–2,100)	23.6 (13.6–39.2)	2,500 (1,500–4,200)
Senegal	0-<12m	52.5 (26.4–103.0)	300 (100–500)	119.9 (69.8–202.8)	600 (400–1,100)
	0-<60m	17.0 (8.6–33.4)	400 (200–900)	39.0 (22.5–67.0)	1,000 (600–1,700)
Solomon Islands	0-<12m	24.3 (12.5–49.1)	5 (3–10)	55.7 (33.9–93.9)	10 (7–20)
	0-<60m	7.2 (3.7–14.7)	7 (4–10)	16.7 (10.0–28.4)	20 (10–30)
Sri Lanka	0-<12m	7.5 (3.3–16.2)	30 (10–50)	17.3 (9.1–31.4)	60 (30–100)
	0-<60m	1.9 (0.9–4.2)	30 (10–70)	4.5 (2.3–8.2)	70 (40–100)
São Tomé and Príncipe	0-<12m	43.4 (22.2–89.0)	3 (1–5)	98.9 (59.3–169.5)	6 (4–10)
	0-<60m	12.6 (6.4–25.8)	4 (2–8)	28.8 (17.1–50.0)	9 (5–20)
Tanzania	0-<12m	56.5 (28.9–110.4)	1,100 (600–2,200)	129.8 (76.0–219.9)	2,600 (1,500–4,400)
	0-<60m	19.0 (9.7–37.2)	1,800 (900–3,500)	43.9 (25.4–75.5)	4,200 (2,400–7,200)
Timor-Leste	0-<12m	47.0 (23.4–90.6)	20 (9–40)	107.3 (62.0–178.8)	40 (20–70)
	0-<60m	16.8	30	38.6	70

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
		(8.4–32.5)	(10–60)	(22.0–65.3)	(40–100)
Tunisia	0-<12m	20.9 (10.2–45.6)	40 (20–90)	48.3 (28.2–86.3)	90 (50–200)
	0-<60m	5.6 (2.8–12.3)	60 (30–100)	13.1 (7.6–23.7)	100 (80–200)
Ukraine	0-<12m	10.0 (4.5–22.8)	40 (20–90)	23.1 (12.4–43.4)	90 (50–200)
	0-<60m	2.2 (1.0–5.1)	50 (20–100)	5.2 (2.8–9.8)	100 (60–200)
Uzbekistan	0-<12m	21.5 (10.6–44.1)	100 (70–300)	49.1 (28.9–83.7)	300 (200–600)
	0-<60m	6.2 (3.1–12.8)	200 (100–400)	14.3 (8.3–24.7)	500 (300–800)
Vanuatu	0-<12m	31.1 (15.9–63.5)	3 (1–6)	71.5 (43.1–121.8)	6 (4–10)
	0-<60m	9.9 (5.0–20.2)	4 (2–8)	22.8 (13.6–39.4)	9 (6–20)
Viet Nam	0-<12m	24.1 (12.0–48.6)	400 (200–800)	55.3 (32.7–93.2)	900 (500–1,500)
	0-<60m	7.1 (3.5–14.3)	600 (300–1,100)	16.3 (9.5–27.8)	1,300 (800–2,200)
West Bank and Gaza	0-<12m	25.2 (12.1–50.0)	30 (20–70)	57.6 (33.3–96.1)	80 (40–100)
	0-<60m	7.1 (3.4–14.2)	50 (20–100)	16.4 (9.4–27.6)	100 (60–200)
Zambia	0-<12m	73.3 (37.8–137.0)	400 (200–800)	168.1 (98.0–277.9)	1,000 (600–1,600)
	0-<60m	23.9 (12.3–44.8)	700 (400–1,300)	55.2 (31.8–92.6)	1,600 (900–2,700)
Zimbabwe	0-<12m	70.9 (34.2–138.6)	300 (100–500)	162.0 (90.0–275.5)	600 (400–1,100)
	0-<60m	20.6 (9.9–40.4)	400 (200–900)	47.3 (26.0–81.8)	1,000 (600–1,700)
Upper-middle-income					
Albania	0-<12m	11.0 (4.7–24.0)	4 (2–8)	25.4 (13.2–45.9)	8 (4–20)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	2.8 (1.2–6.0)	5 (2–10)	6.4 (3.3–11.6)	10 (6–20)
Argentina	0-<12m	10.1 (4.6–23.0)	80 (30–200)	23.5 (12.8–43.8)	200 (100–300)
	0-<60m	2.6 (1.2–5.9)	100 (40–200)	6.0 (3.3–11.3)	200 (100–400)
Armenia	0-<12m	13.7 (6.6–29.1)	5 (3–10)	31.6 (18.1–55.6)	10 (7–20)
	0-<60m	3.4 (1.6–7.1)	7 (3–10)	7.8 (4.4–13.8)	20 (9–30)
Azerbaijan	0-<12m	27.3 (13.1–56.1)	40 (20–90)	62.5 (36.0–106.7)	90 (50–200)
	0-<60m	7.1 (3.4–14.6)	60 (30–100)	16.3 (9.3–28.2)	100 (80–200)
Belarus	0-<12m	3.7 (1.4–9.8)	3 (1–9)	8.6 (3.9–18.9)	8 (4–20)
	0-<60m	0.7 (0.3–1.8)	4 (1–10)	1.6 (0.7–3.6)	9 (4–20)
Belize	0-<12m	14.6 (7.0–30.8)	1 (1–2)	33.4 (19.0–58.3)	3 (2–5)
	0-<60m	3.7 (1.8–7.9)	1 (1–3)	8.6 (4.9–15.1)	3 (2–6)
Bosnia and Herzegovina	0-<12m	6.8 (2.7–17.1)	2 (1–4)	15.6 (7.5–32.1)	4 (2–8)
	0-<60m	1.4 (0.5–3.5)	2 (1–5)	3.2 (1.5–6.6)	4 (2–9)
Botswana	0-<12m	57.6 (28.0–113.4)	30 (20–60)	131.6 (75.1–221.6)	70 (40–100)
	0-<60m	16.5 (8.0–32.6)	40 (20–90)	37.9 (21.3–64.7)	100 (60–200)
Brazil	0-<12m	16.5 (7.7–35.3)	500 (200–1,000)	37.8 (21.3–66.6)	1,100 (600–1,900)
	0-<60m	4.2 (2.0–9.0)	600 (300–1,300)	9.7 (5.4–17.3)	1,400 (800–2,500)
Bulgaria	0-<12m	7.0 (2.9–16.2)	4 (2–10)	16.2 (8.1–31.0)	10 (5–20)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	1.8 (0.7–4.1)	6 (2–10)	4.2 (2.1–8.0)	10 (7–30)
China	0-<12m	8.7 (3.7–20.6)	1,400 (600–3,400)	19.9 (10.4–38.8)	3,300 (1,700–6,500)
	0-<60m	2.1 (0.9–5.1)	1,900 (800–4,400)	5.0 (2.6–9.7)	4,300 (2,200–8,400)
Colombia	0-<12m	15.4 (7.4–32.7)	100 (60–200)	35.5 (20.5–62.3)	300 (200–500)
	0-<60m	4.0 (1.9–8.6)	200 (70–300)	9.3 (5.3–16.4)	300 (200–600)
Costa Rica	0-<12m	9.7 (4.2–21.3)	7 (3–10)	22.3 (11.8–40.7)	20 (8–30)
	0-<60m	2.4 (1.1–5.3)	8 (4–20)	5.6 (2.9–10.2)	20 (10–40)
Cuba	0-<12m	5.8 (2.1–14.5)	6 (2–20)	13.4 (5.9–27.6)	10 (6–30)
	0-<60m	1.2 (0.4–2.9)	7 (2–20)	2.7 (1.2–5.6)	20 (7–30)
Dominica	0-<12m	44.8 (21.4–89.1)	0 (0–1)	101.6 (57.7–171.1)	1 (1–2)
	0-<60m	13.0 (6.2–25.9)	1 (0–1)	29.6 (16.6–50.5)	1 (1–3)
Dominican Republic	0-<12m	36.1 (18.3–74.4)	70 (40–200)	82.8 (49.4–142.4)	200 (100–300)
	0-<60m	10.5 (5.3–21.7)	100 (50–200)	24.1 (14.2–42.1)	200 (100–400)
Ecuador	0-<12m	16.4 (8.0–35.1)	60 (30–100)	37.7 (22.1–66.4)	100 (70–200)
	0-<60m	4.3 (2.1–9.1)	70 (30–200)	9.8 (5.7–17.4)	200 (90–300)
Equatorial Guinea	0-<12m	105.3 (50.8–202.8)	40 (20–80)	239.2 (129.8–411.0)	100 (50–200)
	0-<60m	35.4 (17.0–68.4)	70 (30–100)	80.9 (43.3–141.3)	200 (80–300)
Fiji	0-<12m	34.1 (16.3–65.4)	6 (3–10)	78.0 (44.6–126.7)	10 (8–20)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	9.9 (4.7–18.9)	9 (4–20)	22.7 (12.8–37.3)	20 (10–30)
Gabon	0-<12m	47.2 (23.7–93.5)	30 (20–60)	107.8 (62.8–183.1)	70 (40–100)
	0-<60m	15.8 (7.9–31.2)	50 (20–100)	36.2 (20.8–62.3)	100 (70–200)
Georgia	0-<12m	11.7 (5.1–26.5)	6 (3–10)	26.8 (14.2–49.8)	10 (7–20)
	0-<60m	2.7 (1.2–6.2)	8 (3–20)	6.3 (3.3–11.8)	20 (9–30)
Grenada	0-<12m	17.9 (8.1–35.5)	0 (0–1)	41.2 (22.8–68.4)	1 (0–1)
	0-<60m	4.6 (2.1–9.1)	0 (0–1)	10.6 (5.8–17.7)	1 (1–2)
Guatemala	0-<12m	30.9 (15.3–56.9)	100 (60–200)	70.8 (41.8–111.8)	300 (200–500)
	0-<60m	9.1 (4.5–16.8)	200 (90–300)	21.0 (12.3–33.5)	400 (300–700)
Guyana	0-<12m	39.4 (19.3–79.5)	6 (3–10)	89.8 (52.2–152.2)	10 (8–20)
	0-<60m	11.4 (5.6–23.1)	9 (4–20)	26.1 (15.0–44.9)	20 (10–30)
Indonesia	0-<12m	31.9 (16.3–63.3)	1,500 (700–2,900)	72.8 (44.0–121.4)	3,300 (2,000–5,600)
	0-<60m	8.8 (4.5–17.5)	2,100 (1,100–4,200)	20.2 (12.1–34.2)	4,800 (2,900–8,200)
Iran, Islamic Rep.	0-<12m	16.0 (7.0–33.4)	300 (100–500)	36.5 (19.7–63.3)	600 (300–1,000)
	0-<60m	4.3 (1.9–9.0)	300 (100–700)	9.9 (5.3–17.2)	700 (400–1,300)
Iraq	0-<12m	33.9 (17.0–68.0)	400 (200–700)	78.3 (46.5–131.6)	800 (500–1,400)
	0-<60m	9.5 (4.8–19.1)	500 (300–1,000)	22.1 (13.0–37.6)	1,200 (700–2,000)
Jamaica	0-<12m	16.8 (7.3–38.3)	8 (3–20)	38.8 (20.8–71.6)	20 (9–30)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	4.2 (1.8–9.5)	10 (4–20)	9.6 (5.1–17.9)	20 (10–40)
Jordan	0-<12m	19.9 (9.6–41.2)	40 (20–80)	45.7 (26.5–78.4)	90 (50–200)
	0-<60m	4.7 (2.3–9.8)	50 (20–100)	10.9 (6.3–18.9)	100 (70–200)
Kazakhstan	0-<12m	12.4 (5.4–27.7)	50 (20–100)	28.5 (15.1–52.3)	100 (60–200)
	0-<60m	3.0 (1.3–6.7)	60 (30–100)	6.9 (3.6–12.7)	100 (70–200)
Lebanon	0-<12m	8.0 (3.2–19.0)	9 (4–20)	18.5 (9.0–36.0)	20 (10–40)
	0-<60m	2.0 (0.8–4.7)	10 (5–30)	4.5 (2.2–8.9)	30 (10–50)
Libya	0-<12m	14.1 (6.2–30.2)	20 (7–40)	32.4 (17.4–57.3)	40 (20–70)
	0-<60m	3.4 (1.5–7.3)	20 (9–50)	7.8 (4.2–13.9)	50 (30–90)
Malaysia	0-<12m	9.5 (4.4–22.1)	50 (20–100)	21.8 (12.0–41.5)	100 (60–200)
	0-<60m	2.5 (1.1–5.8)	70 (30–200)	5.7 (3.1–11.0)	100 (80–300)
Maldives	0-<12m	8.5 (3.7–19.7)	1 (0–1)	19.5 (10.2–37.3)	1 (1–3)
	0-<60m	2.1 (0.9–4.8)	1 (0–2)	4.7 (2.5–9.1)	2 (1–3)
Marshall Islands	0-<12m	57.4 (28.8–113.3)	1 (0–1)	131.1 (77.6–218.9)	1 (1–2)
	0-<60m	16.6 (8.3–32.9)	1 (0–2)	38.1 (22.3–64.6)	2 (1–3)
Mexico	0-<12m	17.0 (8.4–33.1)	400 (200–700)	39.1 (23.1–64.3)	800 (500–1,400)
	0-<60m	4.3 (2.1–8.3)	500 (200–900)	9.9 (5.8–16.3)	1,100 (600–1,800)
Montenegro	0-<12m	1.9 (0.6–6.0)	<1	4.5 (1.8–11.4)	0 (0–1)

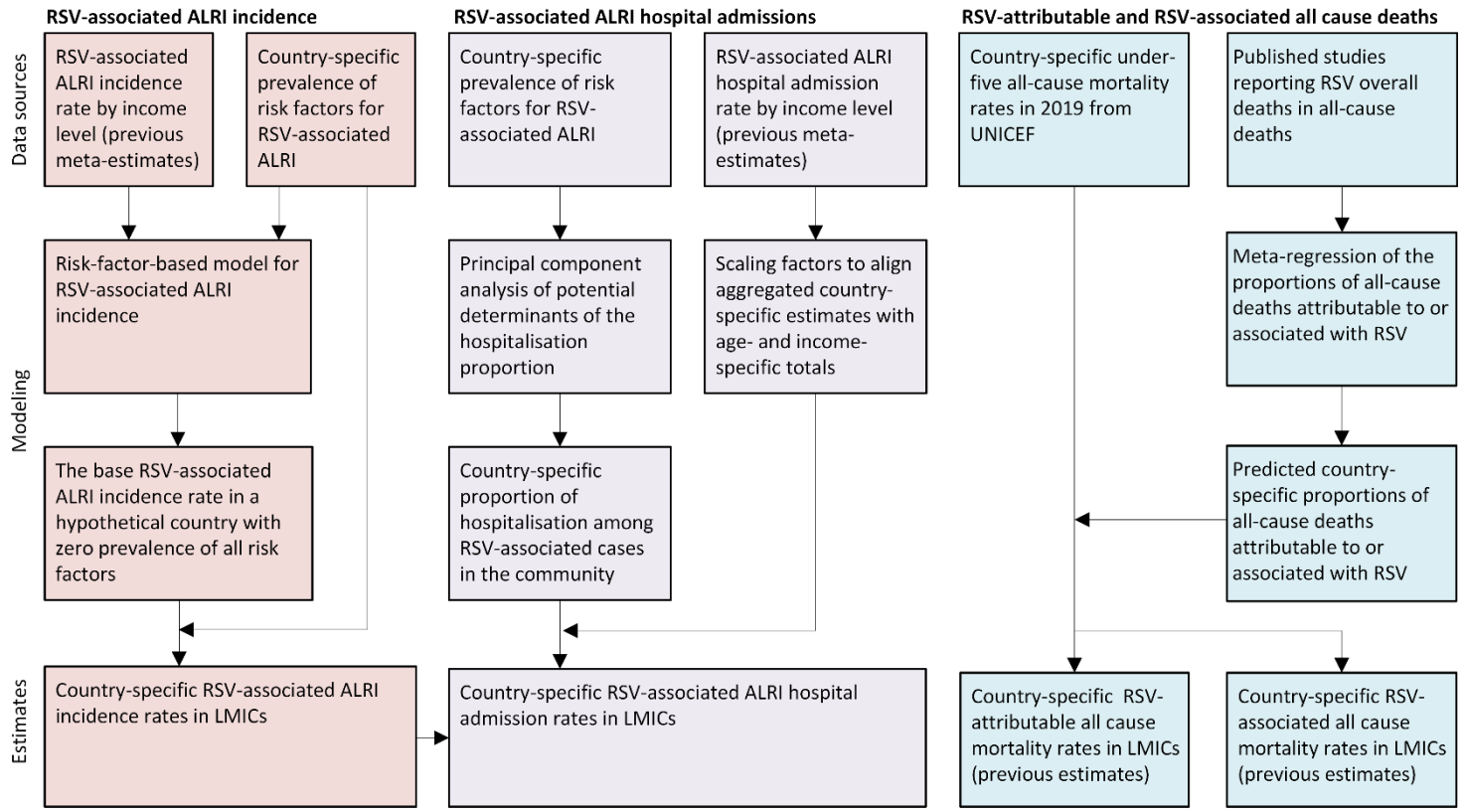
Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	0.5 (0.2–1.5)	0 (0–1)	1.1 (0.4–2.8)	0 (0–1)
Namibia	0-<12m	48.1 (23.7–97.7)	30 (20–70)	110.3 (63.4–191.0)	70 (40–100)
	0-<60m	15.4 (7.6–31.4)	50 (30–100)	35.5 (20.2–62.4)	100 (70–200)
North Macedonia	0-<12m	6.5 (2.6–15.8)	1 (1–3)	15.1 (7.3–30.1)	3 (2–7)
	0-<60m	1.4 (0.6–3.4)	2 (1–4)	3.3 (1.6–6.5)	4 (2–7)
Paraguay	0-<12m	24.2 (11.9–50.1)	30 (20–70)	55.3 (32.4–94.9)	80 (50–100)
	0-<60m	7.1 (3.5–14.8)	50 (20–100)	16.3 (9.5–28.4)	100 (70–200)
Peru	0-<12m	14.4 (6.9–30.3)	90 (40–200)	33.2 (19.1–57.8)	200 (100–400)
	0-<60m	4.0 (1.9–8.4)	100 (50–200)	9.2 (5.3–16.2)	300 (100–500)
Russian Federation	0-<12m	6.2 (2.3–14.9)	100 (40–300)	14.3 (6.6–28.5)	300 (100–500)
	0-<60m	1.3 (0.5–3.2)	100 (50–300)	3.1 (1.4–6.1)	300 (100–600)
Samoa	0-<12m	14.1 (6.6–30.0)	1 (0–2)	32.5 (18.3–56.9)	2 (1–3)
	0-<60m	4.0 (1.9–8.6)	1 (1–2)	9.3 (5.2–16.4)	3 (1–4)
Serbia	0-<12m	5.1 (1.8–12.7)	4 (2–10)	11.9 (5.1–24.3)	10 (4–20)
	0-<60m	1.2 (0.4–2.9)	5 (2–10)	2.7 (1.2–5.6)	10 (5–20)
South Africa	0-<12m	48.0 (23.4–89.7)	500 (300–1,000)	109.4 (63.0–175.7)	1,200 (700–2,000)
	0-<60m	13.5 (6.6–25.4)	800 (400–1,500)	31.0 (17.6–50.5)	1,800 (1,000–2,900)
St. Lucia	0-<12m	29.3 (14.3–59.1)	1 (0–1)	67.4 (39.4–113.7)	1 (1–2)

Country	Age	RSV-attributable mortality		RSV-associated mortality	
		Mortality rate (per 100,000) person-years	Number of deaths	Mortality rate (per 100,000 person-years)	Number of deaths
	0-<60m	8.5 (4.1–17.1)	1 (0–2)	19.6 (11.3–33.5)	2 (1–3)
St. Vincent and the Grenadines	0-<12m	26.5 (11.9–56.1)	0 (0–1)	61.3 (33.7–107.1)	1 (0–1)
	0-<60m	3.8 (1.7–8.0)	0 (0–1)	8.8 (4.8–15.4)	1 (0–1)
Suriname	0-<12m	23.2 (11.0–48.6)	2 (1–5)	53.1 (30.2–92.1)	5 (3–9)
	0-<60m	6.3 (3.0–13.3)	3 (2–7)	14.6 (8.2–25.6)	8 (4–10)
Thailand	0-<12m	10.0 (4.3–23.3)	70 (30–200)	23.1 (12.2–43.9)	200 (90–300)
	0-<60m	2.5 (1.1–5.8)	90 (40–200)	5.8 (3.0–11.1)	200 (100–400)
Tonga	0-<12m	25.1 (12.3–51.9)	1 (0–1)	57.6 (33.7–98.9)	1 (1–2)
	0-<60m	6.6 (3.2–13.7)	1 (0–2)	15.2 (8.8–26.4)	2 (1–3)
Turkmenistan	0-<12m	63.0 (31.9–126.0)	80 (40–200)	144.4 (84.9–246.2)	200 (100–300)
	0-<60m	16.5 (8.3–33.1)	100 (60–200)	38.0 (22.0–65.7)	300 (100–400)
Tuvalu	0-<12m	34.9 (17.5–69.4)	<1	80.0 (47.6–133.6)	<1
	0-<60m	10.1 (5.1–20.1)	<1	23.2 (13.7–39.3)	<1
Türkiye	0-<12m	11.4 (5.2–24.3)	100 (70–300)	26.4 (14.4–46.7)	300 (200–600)
	0-<60m	2.8 (1.3–6.0)	200 (80–400)	6.5 (3.5–11.7)	400 (200–800)
Venezuela, RB	0-<12m	37.8 (18.5–75.7)	200 (80–300)	86.5 (50.5–145.2)	400 (200–600)
	0-<60m	9.5 (4.6–19.0)	200 (100–500)	21.8 (12.6–37.1)	500 (300–900)

381 RSV = respiratory syncytial virus.

382

383 # Figures



384 **Figure 1.** Analytical framework for estimating country-specific RSV-associated ALRI burden in low- and middle-income countries.

385 RSV = respiratory syncytial virus. ALRI = acute lower respiratory infection.

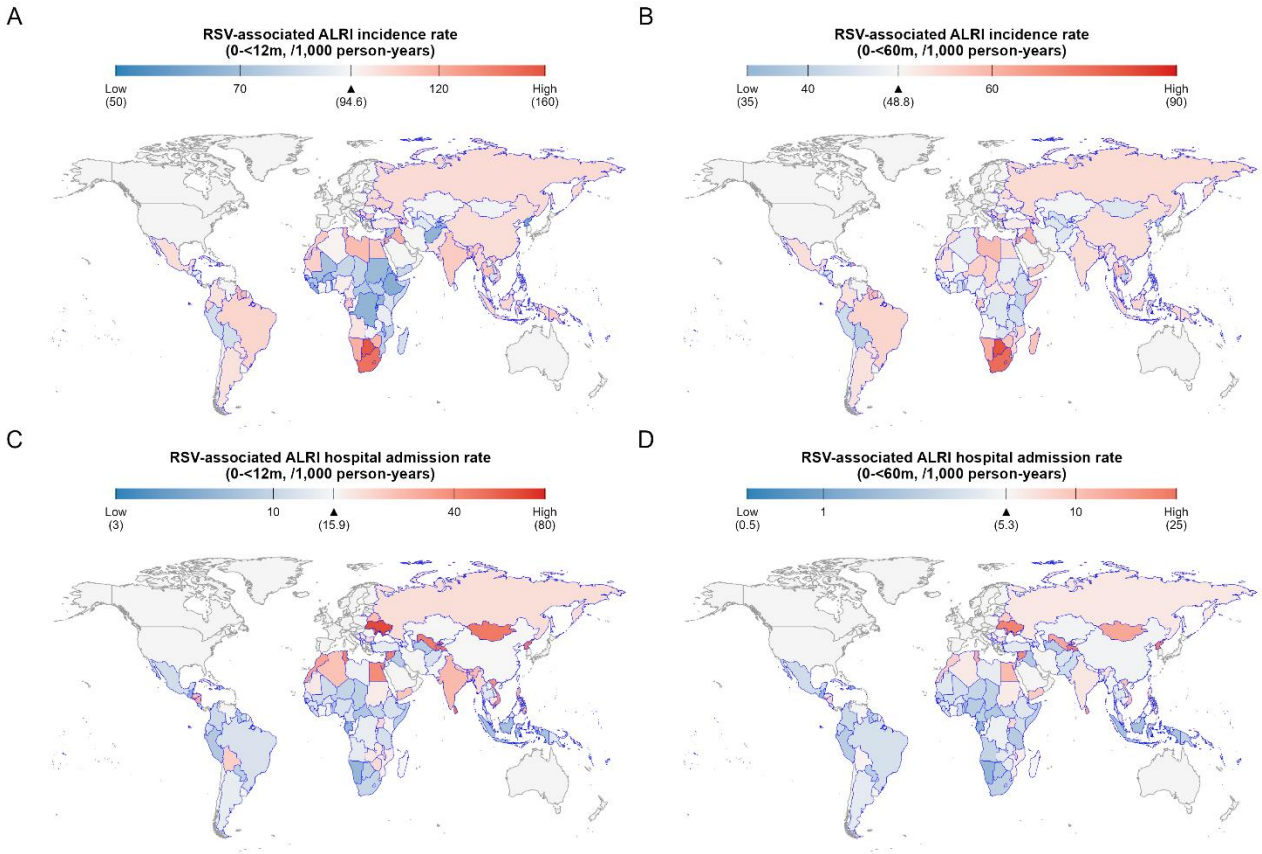


Figure 2. RSV-associated ALRI incidence rate, and hospital admission rate in infants aged 0–<12 months, and children aged 0–<60 months in low- and middle-income countries.

RSV = respiratory syncytial virus. ALRI = acute lower respiratory infection. Colour scale is based on log10-transformed values. Triangle (▲) denotes the global mean reported in Li et al. Lancet 2022[1].

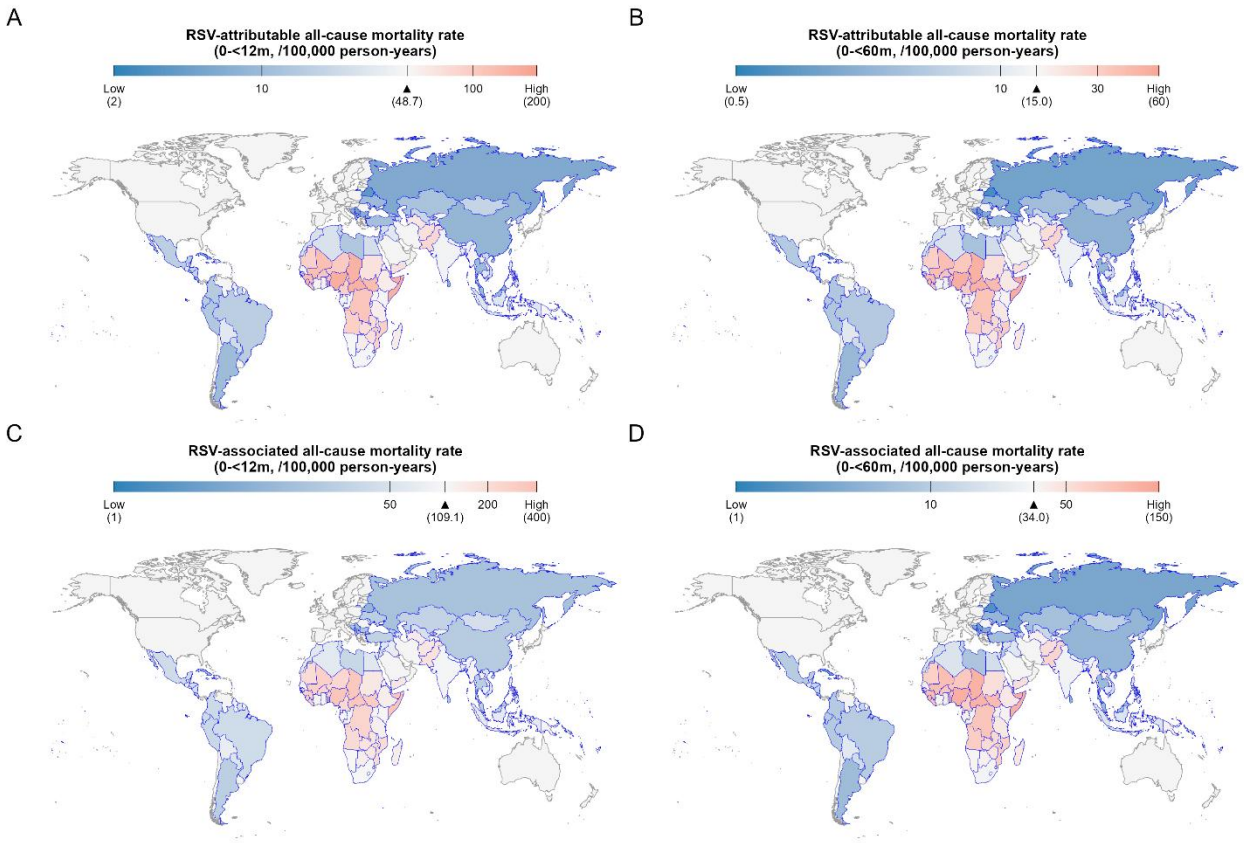
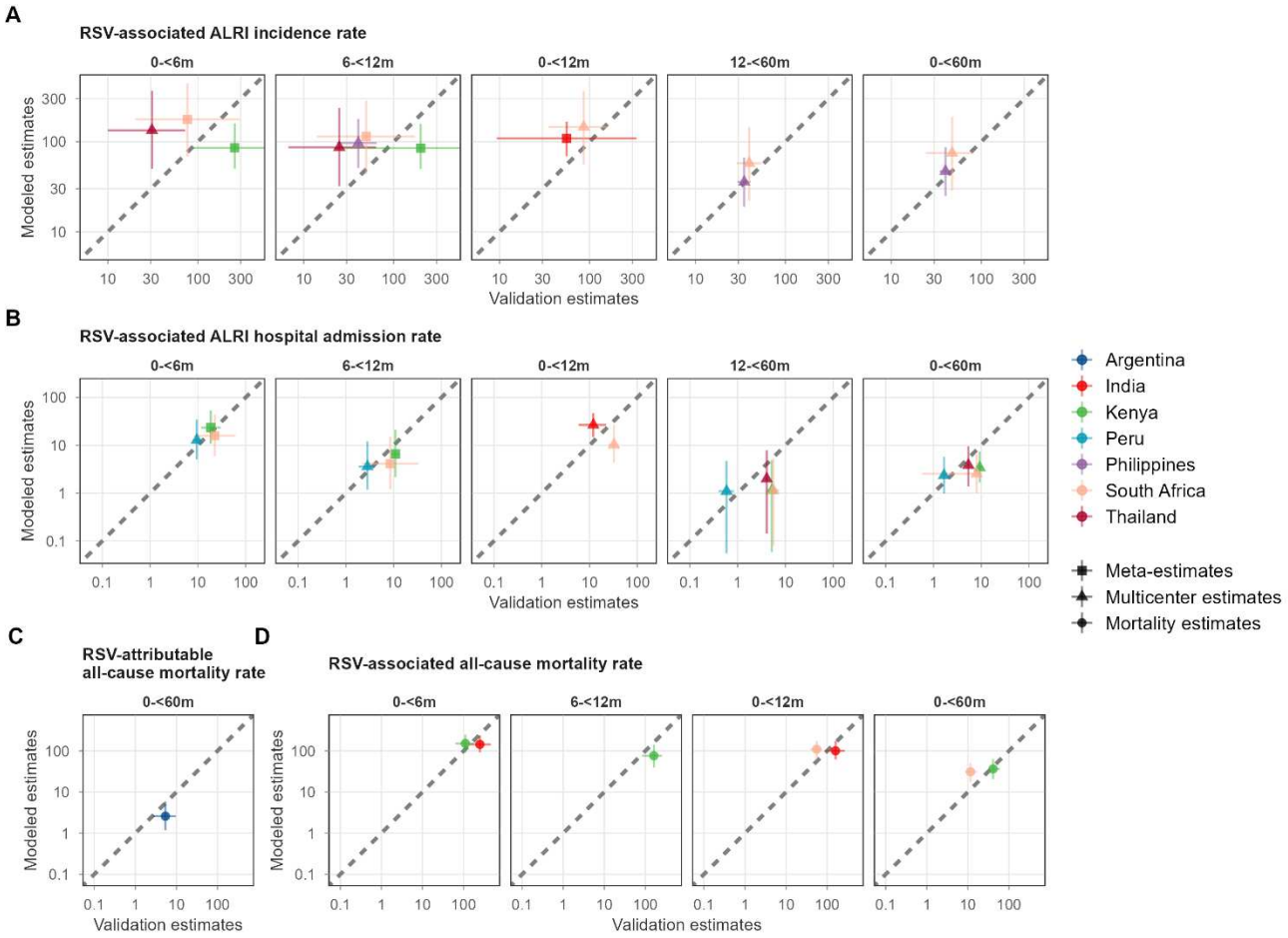


Figure 3. RSV-attributable mortality rate and RSV-associated mortality rate in infants aged 0–<12 months, and children aged 0–<60 months in low- and middle-income countries. RSV = respiratory syncytial virus. ALRI = acute lower respiratory infection. Colour scale is based on log10-transformed values. Triangle (▲) denotes the global mean reported in Li et al. Lancet 2022[1].



398 **Figure 4.** Model validation results by outcome and age group.

399 RSV = respiratory syncytial virus. ALRI = acute lower respiratory infection.

400

Supplementary Files

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- Appendixfinal.docx
- RSLiYou.pdf