

Summary of global epidemiology and disease burden estimates for RSV

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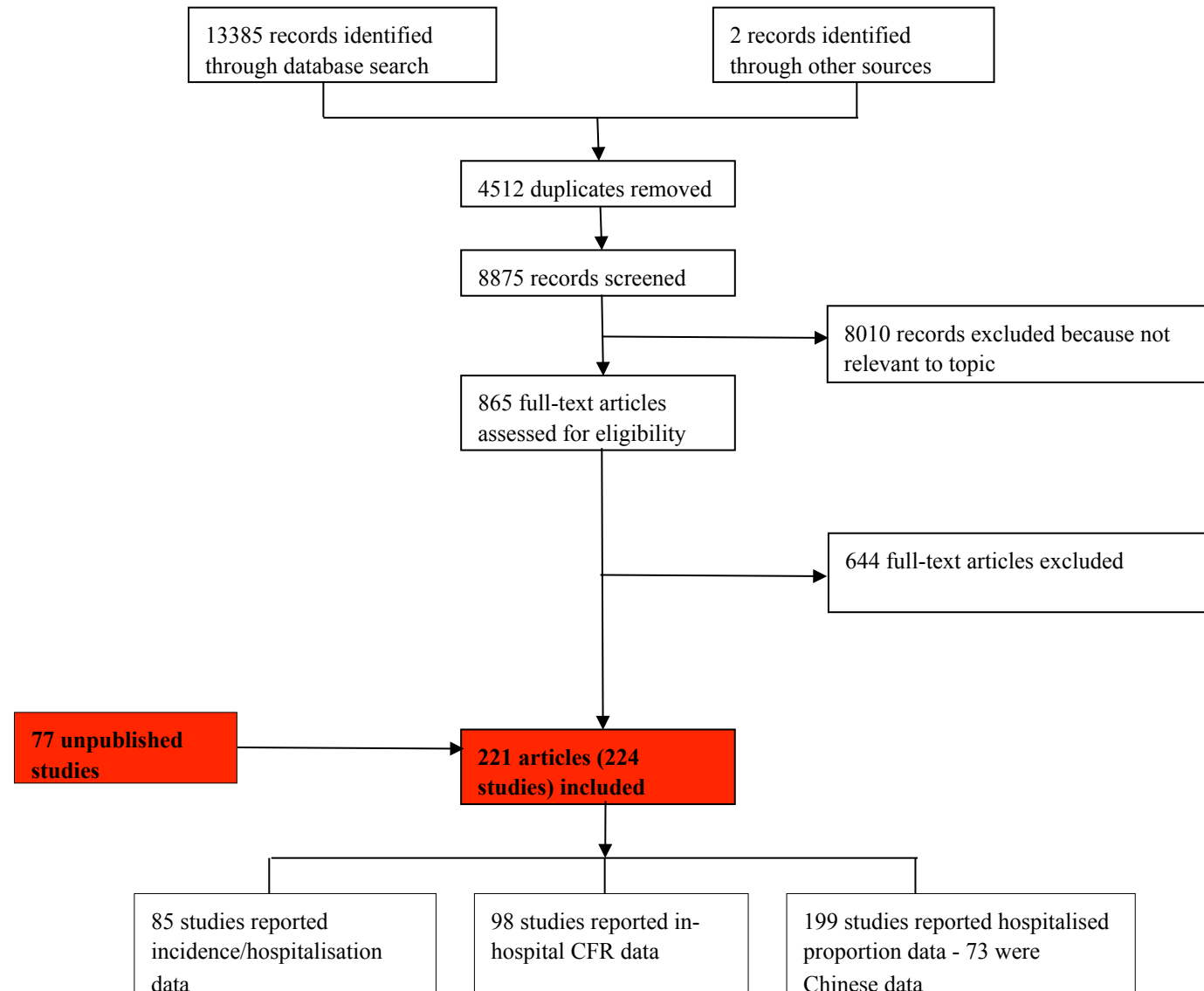
Global burden of acute lower respiratory infections due to respiratory syncytial virus in young children: a systematic review and meta-analysis

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ALRI = Pneumonia + Bronchiolitis

- **33.4 million** cases of RSV-associated ALRI (6 studies)
- **3.4 million** cases of RSV-associated hospitalised (severe) ALRI (29 studies)
- **53,250 to 199,000** deaths due to RSV-associated ALRI

Systematic review



Case definitions

- Community-based (active) case ascertainment

Cough / difficulty breathing AND RSV positive

- RSV-associated ALRI: tachypnoea (IMCI cut-offs)
- RSV-associated severe ALRI: chest wall indrawing AND / danger signs

- Hospital-based (passive) case ascertainment

Hospitalised RSV-ALRI: Hospitalisation with a physician confirmed diagnosis of ALRI and RSV positive on laboratory confirmation

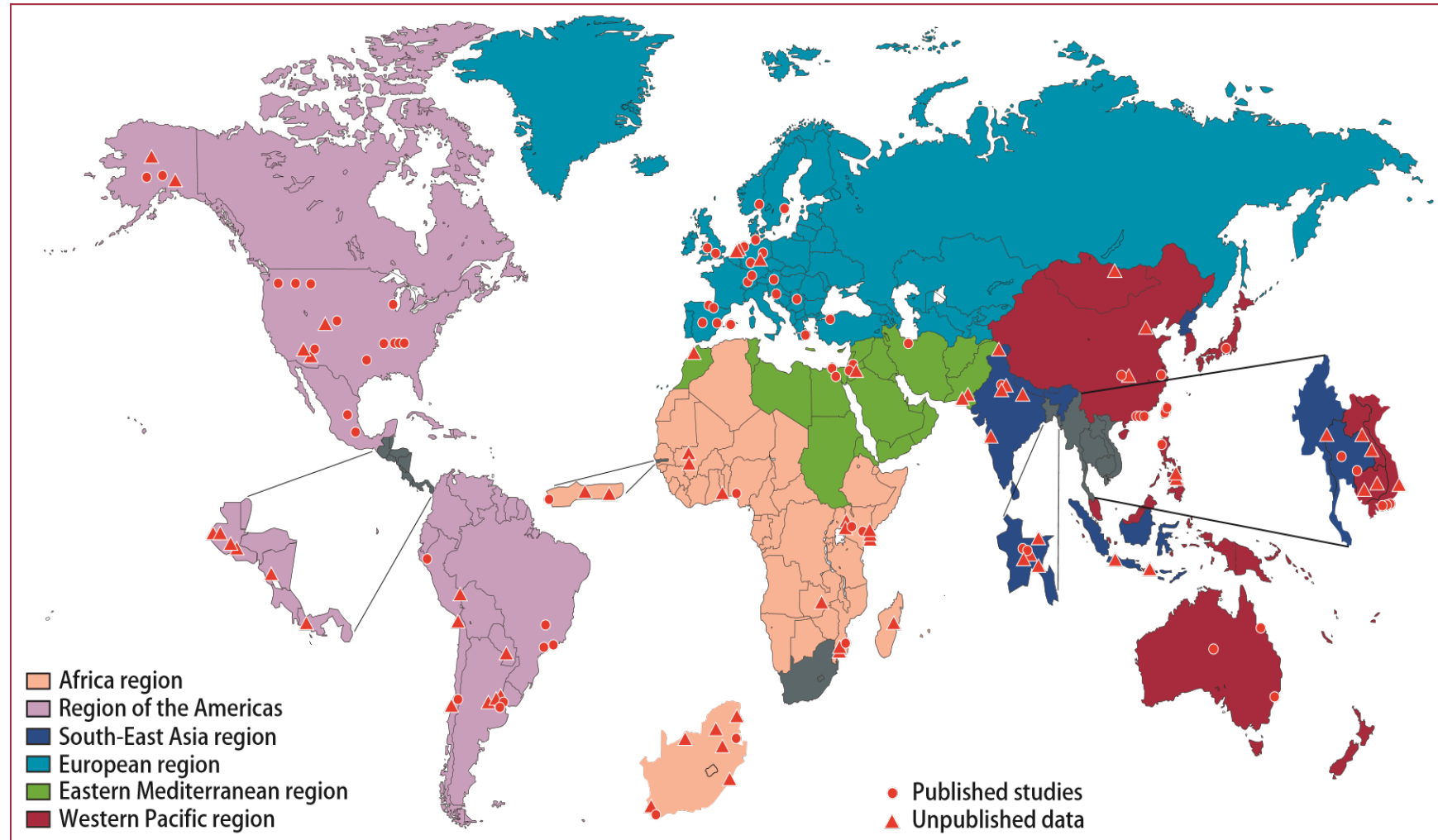
- RSV season

Any month of the year with ≥ 10 specimens submitted and $> 5\%$ RSV positive

Principles underpinning RSV-ALRI mortality estimates

- Identify data sources on pneumonia mortality in community
 - verbal autopsy, *mortality surveys*, *medical certification of deaths*
- Sufficient number of pneumonia deaths
- Data for minimum three complete years
- RSV transmission- clear seasonality, no shared seasonality with influenza

Location of incidence and hospital mortality studies (n=171)



RSV-ALRI in-hospital CFR in children <5 y

Region (% global U-5 pop.)	# studies	h-CFR [%] (95% CI) 0-5 mo	h-CFR [%] (95% CI) 6-11 mo	h-CFR [%] (95% CI) 12-59 mo
High income (12%)	6	0.2 (0.0, 12.8)	0.9 (0.2, 4.0)	0.7 (0.1, 5.2)
Upper middle income (26%)	12	1.7 (1.2, 2.6)	2.4 (1.1, 5.4)	0.5 (0.1, 3.5)
Lower middle income (47%)	16	2.7 (2.0, 3.6)	2.8 (1.8, 4.4)	2.7 (1.7, 4.3)
Low income (16%)	19	1.7 (0.4, 6.8)	9.3 (3.0, 28.7)	4.7 (0.7, 33.7)
Developing	41	2.2 (1.8, 2.7)	2.4 (1.9, 3.2)	2.2 (1.6, 3.0)
Industrialised	2	N/A	N/A	N/A

INTERIM ESTIMATES: PLEASE DO NOT CITE OR QUOTE

Estimating RSV-ALRI mortality in community

- Pneumonia mortality and RSV seasonality data availability

Location	Study period	Number of pneumonia deaths
Lombok, Indonesia	2000–2002	2115
Multicentre, Bangladesh	2010–2012	208
Buenos Aires, Argentina	2011–2013	100
Agincourt, South Africa	2010–2013	71
Ballabgarh (Haryana), India	2010–2012	36
Lwak (Asembo), Kenya	2007–2010	15
Kamalapur (Dhaka), Bangladesh	2005–2007	39
Bohol, Philippines	2000–2004	6

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RSV-ALRI mortality in community –Limitations

- RSV-ALRI mortality only occurs in the RSV season
- Attributing all excess ALRI mortality during RSV season to RSV *overestimates RSV mortality*
- Exclusion of secondary bacterial infection post RSV-ALRI *underestimates RSV mortality*
- Lack of national ALRI mortality estimates in children <1 year – No overall RSV-ALRI mortality in this age group

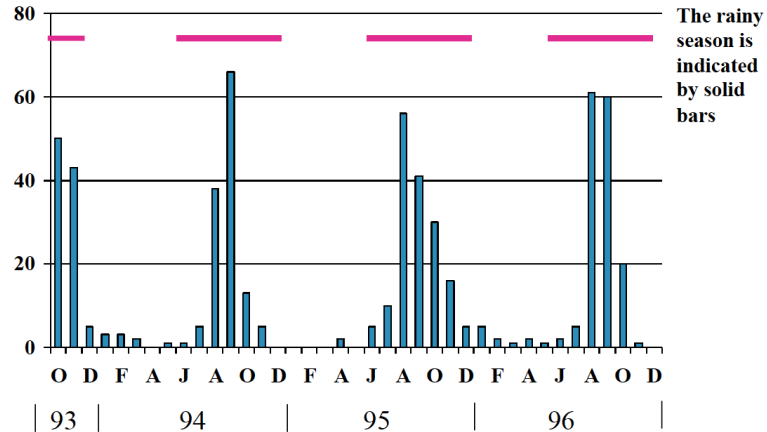
RSV Prevention and Recurrent Wheeze

	US RSV-IGIV Study ¹	Canada-Europe Palivizumab study ²	Japan Palivizumab study ³	Dutch Palivizumab study ⁴	North American Aboriginal Peoples Motavizumab Study ⁵
Type	RCT	Observational	Observational	RCT	RCT
Years Conducted	1999-2000	2001-2004	2007-2010	2008-2010	2004-2010
Years F-U	7 - 10	3	3	1	3
Study Population	Preterm infants ≤ 35 wGA with BPD/CLD	Preterm ≤ 35 wGA no CLD	Preterm 33 to 35 wGA no CLD	Preterm 33 to 35 wGA no CLD	Infants ≥ 36 wGA
Primary Outcome (% Relative reduction)					
Normal FEV1/FVC	75*				
Recurrent wheeze (Parent)				47*	
Recurrent wheeze (Parent or medically attended)		49*			
Recurrent wheeze (Medically attended)		51*	66*		-50

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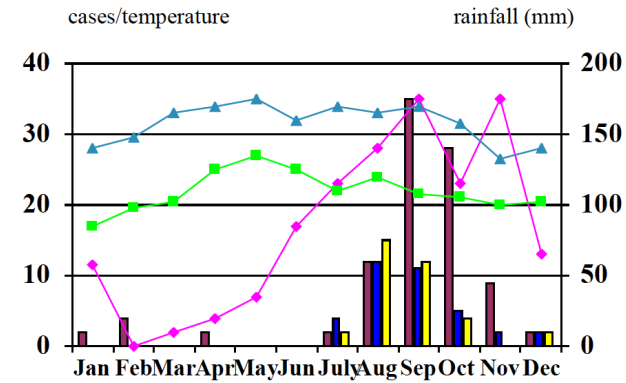
RSV Seasonality

Banjul, Gambia 22 ° N



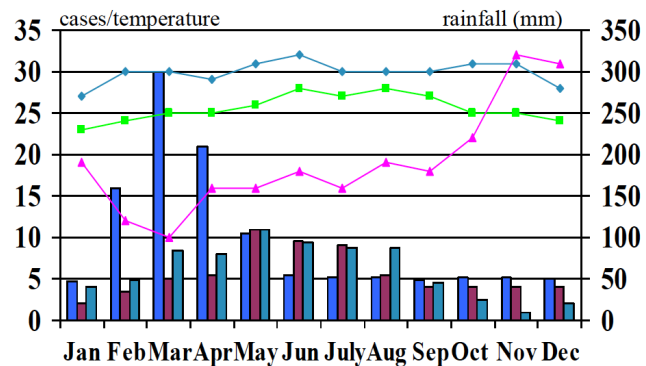
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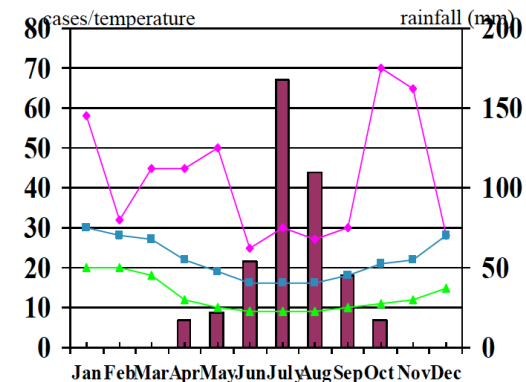
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Summary

- RSV associated with about 25% of ALRI episodes in children <5 years
- 37% of RSV-severe ALRI and 42% of RSV hospitalisations in infants 0-5 months
- Overall RSV-ALRI mortality in children <5 years – 53,000 to 199,000
- Updated overall RSV-mortality estimates will be available soon
- Strong association between RSV in infancy and recurrent wheeze

Policy Gaps for RSV Vaccine Introduction in Developing Countries

- Data on severe maternal RSV ALRI
- Data on RSV morbidity and mortality in first 3-4 months of life
- Data on long term effects of RSV
- Direct and indirect costs of RSV ALRI
- Robust routine RSV seasonality data

Acknowledgements

- Bill and Melinda Gates Foundation

- Ting Shi



- Mortality sub-group – E Simoes, K O’Brien, B Gessner, F Polack, S Madhi,
- U of Edinburgh –David McAllister, Evelyn Balsells, Harry Campbell
- RSV GEN collaborators- J Nokes, A Brooks, D Feikin, M Venter, J Moyes, E Azziz-Baumgartner, A Gordon, G Bacalla, J Montgomery, S Broor, M Chadha, S Hirve, A Krishnan, R Singleton, S Thamthithiwat, M Oliveira, M Echhavarria, R Fasce, Y Hongjie, M Lucero, C Kartasasmita, C Lupisan, S Howie, H Oshitani, L Yoshida, C Turner, K Strum-Ramirez, J McCracken, A Ali, H Zar, Z Rasmussen, L Bont, W Clara, J Jara, P Byass, A Scott, D Thea, C Romero, P Buchy and their team