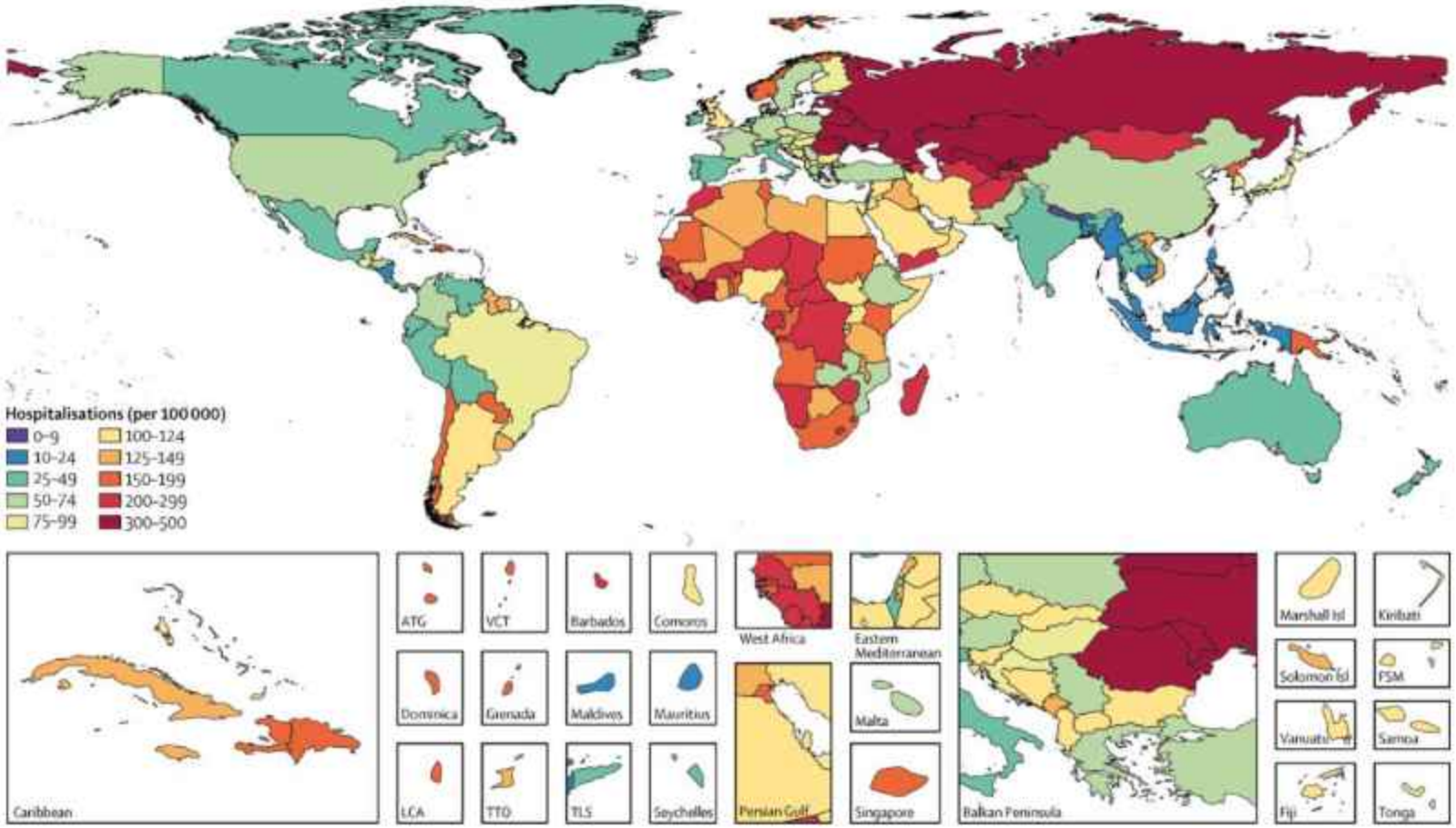
GBD FLU-LRTI: HOSPITALIZATION

THE LANCET
Respiratory Medicine

Mortality, morbidity, and hospitalisations due to influenza lower respiratory tract infections, 2017: an analysis for the Global Burden of Disease Study 2017



Influenza lower respiratory tract infection hospitalizations per 100 000 for all ages, 2017

The countries with the highest estimated rates of influenza LRTI hospitalisation per 100 000 population were **Lithuania** (560·7 [227·2–1351·7]) and **Russia** (494·4 [183·6–1241·6]), whereas **Nepal** (9·4 [3·2–25·7]) and **Bangladesh** (11·9 [3·7–33·8]) had the lowest rates per 100 000

The proportion hospitalized was highest in adults older than 70 years (appendix p 29)

GBD FLU-LRTI: MORTALITY

THE LANCET
Respiratory Medicine

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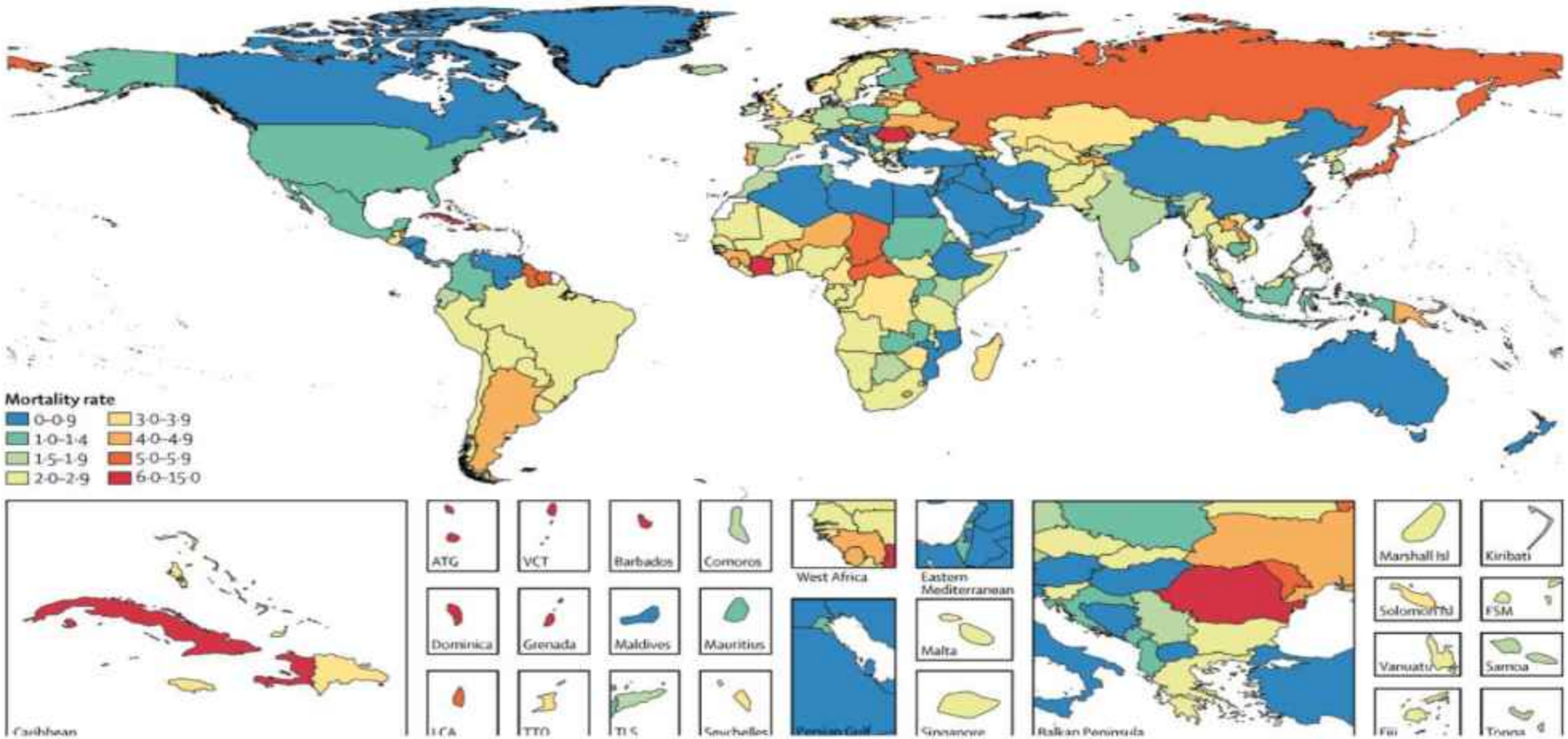

Influenza lower respiratory tract infection mortality rate per 100 000 for all ages, 2017

GBD FLU-LRTI: IRAN (2017)

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Mortality, morbidity, and hospitalisations due to influenza lower respiratory tract infections, 2017: an analysis for the Global Burden of Disease Study 2017

IRAN 2017 - Of 100,000 Influenza cases in Iran:

- **Incidence of LRTI**:
  - No. of Cases: 482,000 (332,000-674,000)
  - Rate: 578(404-821)/100,000
- **Hospitalizations**:
  - No. of Cases: 84,000(29000-230,000)
  - Rate: 110 (38-302)/100,000
- **Mortality:**
  - No. of Cases: 12,000(4000-32,000)
  - Rate: 0.6 (0.3-0.9)/100,000

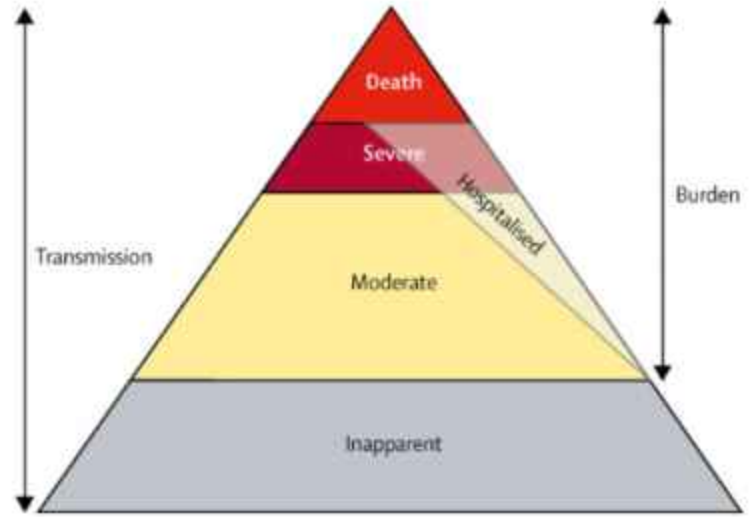
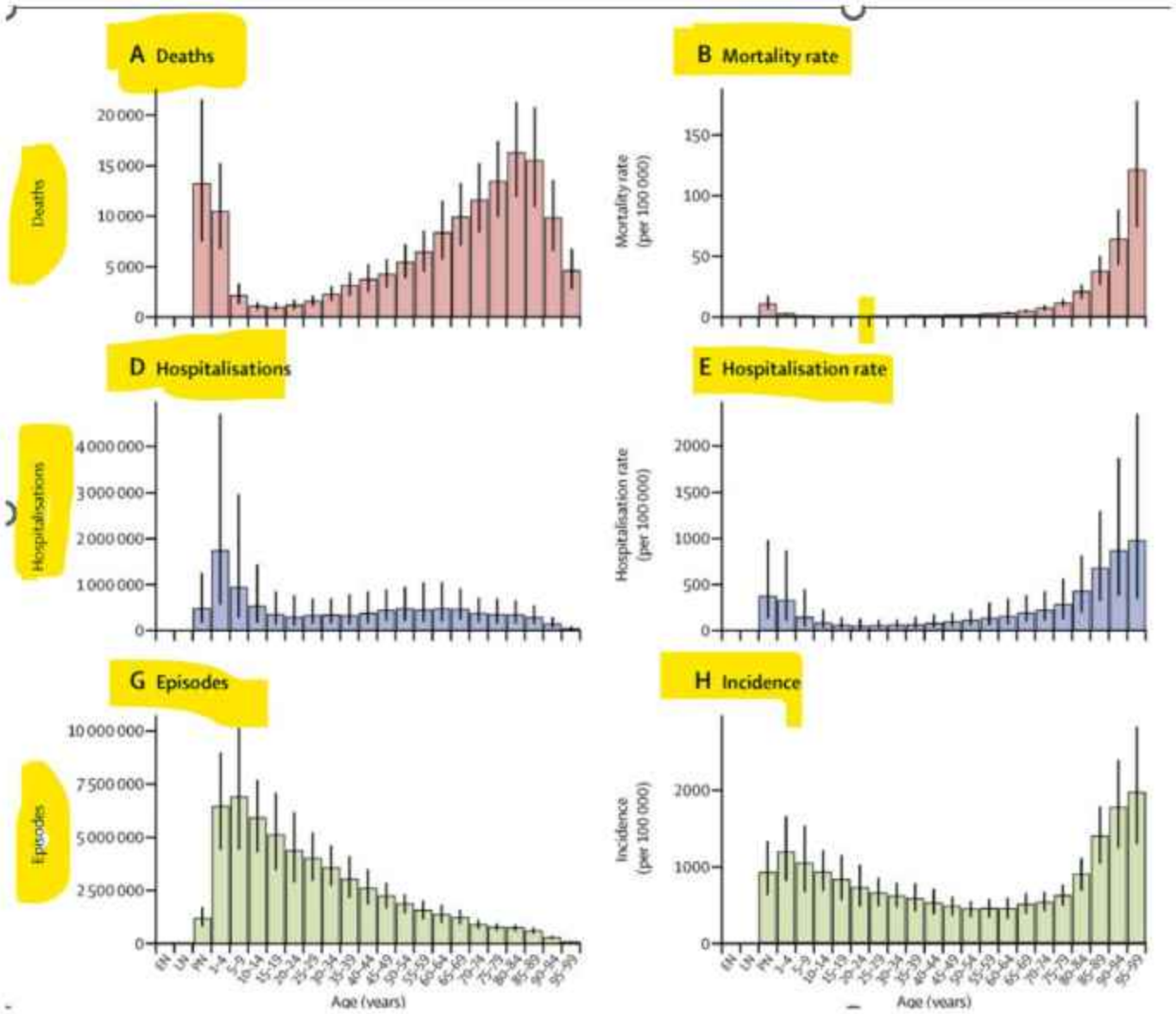


Figure 1 Conceptual diagram of the influenza LRTI burden pyramid

Age groups with the highest underlying rate of LRTI have the highest influenza LRTI burden



Elderly and flu

Age distribution of deaths attributed to influenza lower respiratory tract infections (A–C), hospitalisations attributed to influenza lower respiratory tract infections (D–F)

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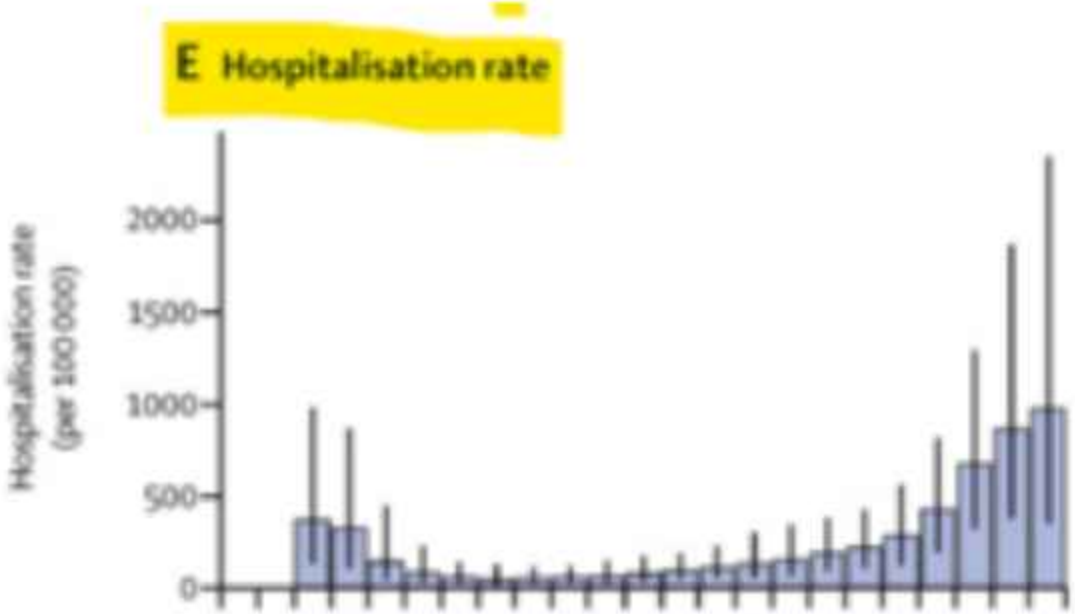
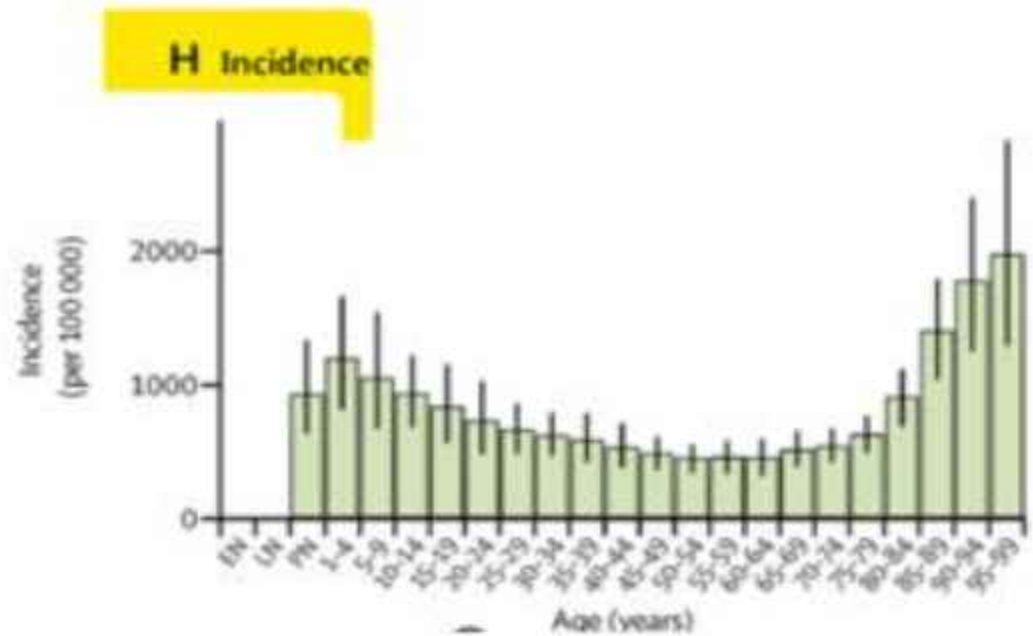
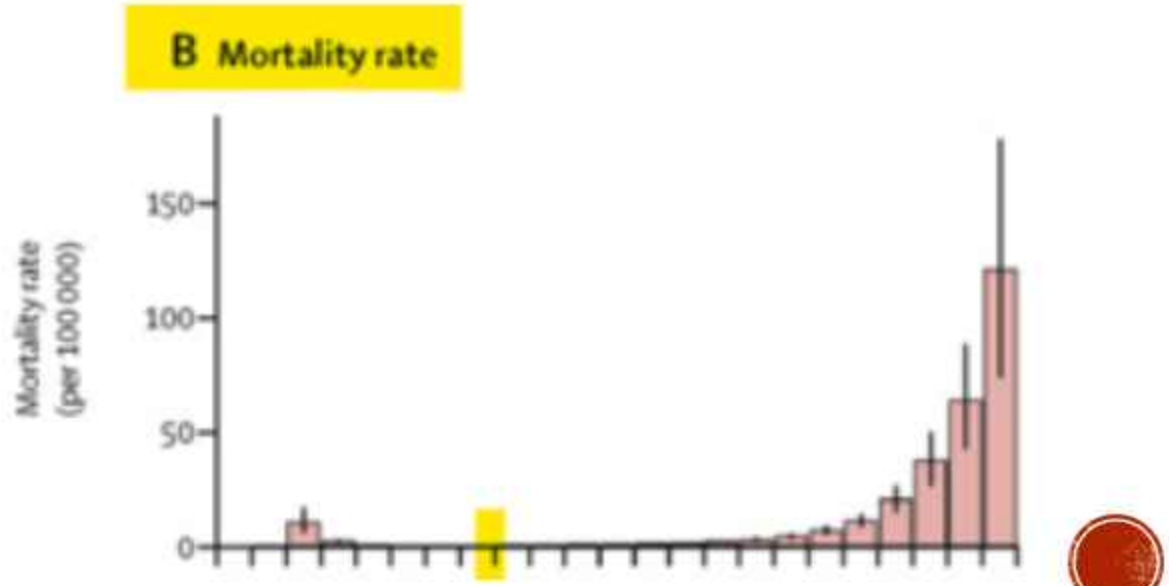
flu with LRTI by AGE

Age distribution of deaths attributed to influenza lower respiratory tract infections







GLOBAL BURDEN OF FLU

Global burden of influenza-associated lower respiratory tract infections and hospitalizations among adults: A systematic review and meta-analysis

Kathryn E. Lafond, Rachael M. Porter, Melissa J. Whaley, Zhou Suizan, Zhang Ran, Mohammad Abdul Aleem, Binay Thapa, Borann Sar, Viviana Sotomayor Proschle, Zhibin Peng, Luzhao Feng, Daouda Coulibaly, Edith Nkwembe, [...].
Global Respiratory Hospitalizations–Influenza Proportion Positive (GRIPP) Working Group [view all]

Version 2 | Published: March 1, 2021 • https://doi.org/10.1371/journal.pmed.1003550

The primary meta-analysis model (63 datasets of 110) found influenza associated with:

- **14.1%** (95% CI 12.1%–16.5%) of **acute respiratory hospitalizations** (all adults).
  - **Influenza A** viruses were associated with an estimated **10.6%** (95% CI 8.9%–12.5%) of these episodes, and
  - **influenza B** viruses with **3.5%** (95% CI 2.8%–4.3%)
- **influenza-associated hospitalizations** equated to:
  - 3,464,000 adults 20–64 years ~ **2,831,000 among ≥65 years**
- 80 (95% CI 44–139) hospitalizations/100,000 population <65 years and
- 437 (95% CI 265–612) hospitalizations/100,000 **older adults+65**

Hospitalizations each year: 5 times higher among older adults

https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003550 2021

Global burden of influenza-associated lower respiratory tract infections and hospitalizations among adults: A systematic review and meta-analysis

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Version 2 Published: March 1, 2021 • https://doi.org/10.1371/journal.pmed.1003550

LRTI influenza type A? or B?

- 4,264,000 (95% CI 2,185,000–7,353,000) influenza A–associated and
- 1,408,000 (95% CI 322,000–3,034,000) influenza B–associated,

Associated LRI episodes 75% type A

- 24,126,000 (95% CI 13,880,000–36,677,000) influenza A, and
- 7,966,000 (95% CI 1,650,000–15,426,000) influenza B

Virus influenza type A in 75%

https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003550 2021

COST OF FLU

Adv Ther. 2024 Jan;41(1):945–966. doi: 10.1007/s12325-023-02770-0

The Cost of Seasonal Influenza: A Systematic Literature Review on the Humanistic and Economic Burden of Influenza in Older (≥ 65 Years Old) Adults

Jakob Langer, Verna L Welch, Mary M Moran, Alejandro Cane, Santiago M C Lopez, Amit Srivastava, Ashley Enstone, Amy Sears, Kristen Markus, Maria Heuser, Rachel Rowley, Isabelle Whittle

- **Economic impact, including**
  - **Direct costs** (e.g., drug consumption and hospitalizations),
  - **Indirect costs** (such as absenteeism and reduced productivity), and
  - **Intangible costs** (e.g., pain, suffering and impaired quality of life).

USA annual costs of influenza:

- Direct cost-of-illness: $1–3 billion- $10.4 billion
- Indirect costs- including loss of earnings: $10–15 billion - $16.3 billion
- Other estimates total economic burden of $87.1 billion.

FLU ELDERLY BURDEN

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Jakob Langer [1,5,6], Verna L Welch [2], Mary M Moran [2], Alejandro Cane [2], Santiago M C Lopez [2], Amit Srivastava [3], Ashley Enstone [4], Amy Sears [4], Kristen Markus [4], Maria Heuser [4], Rachel Kewley [4], Isabelle Whittle [4]

38 Studies: economic burden of influenza in ≥ 65 years

▪ Estimated cost (in million$):	direct/	indirect/	total
❖ Not medically attended but ill	$9.81/	$266.67/	$276.48
❖ Office-based outpatient visits	$16.24/	$15.60/	$31.85
❖ Emergency department	$70.86/	$11.42/	$82.28
❖ **Hospitalization**	**$1273.73/**	**$40.45/**	**$1314.18**
❖ **Deaths**	**NR/**	**$710.1/**	**$710.1**
❖ **Total**	**$1370.64/**	**$1044.24/**	**$2414.88**

83%

https://pmc.ncbi.nlm.nih.gov/articles/PMC10879238/

FLU ELDERLY BURDEN

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humanistic burden of influenza in ≥ 65 years

QALYs/QALDs and HRQoL, Patient satisfaction and preference, Impact on daily living (7-9days), Functional decline (4-8d), Transition to assisted care, Impact of long-term symptoms (ranged between 2 and 15 days)/complications, Time to return to baseline(4-15), Caregiver reported symptoms(1-3d), QoL, and HRQoL, **Extra GP**/ER visits, Incidence and duration of hospital/ICU stays, Pharmacy costs, Short- and long-term care, Progression to secondary infection, Absenteeism for patients and caregivers(average of 4.9 lost workdays)

https://pmc.ncbi.nlm.nih.gov/articles/PMC10879238/