

Global Health and Aging: Infectious Diseases and the Elderly

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March 17, 2018

No relevant disclosures



We are getting older

Percentage of total population by broad age group, both sexes (per 100 total population)

Age	2000	2005	2010	2015	2020	2025
Total	100.0	100.0	100.0	100.0	100.0	100.0
0-1	4.0	3.9	3.8	3.7	3.5	3.3
0-4	9.9	9.5	9.4	9.1	8.7	8.3
65+	6.9	7.3	7.6	8.3	9.4	10.4
75+	2.5	2.7	3.0	3.3	3.5	3.9
85+	0.5	0.5	0.6	0.7	0.8	0.9

United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, custom data acquired via website.



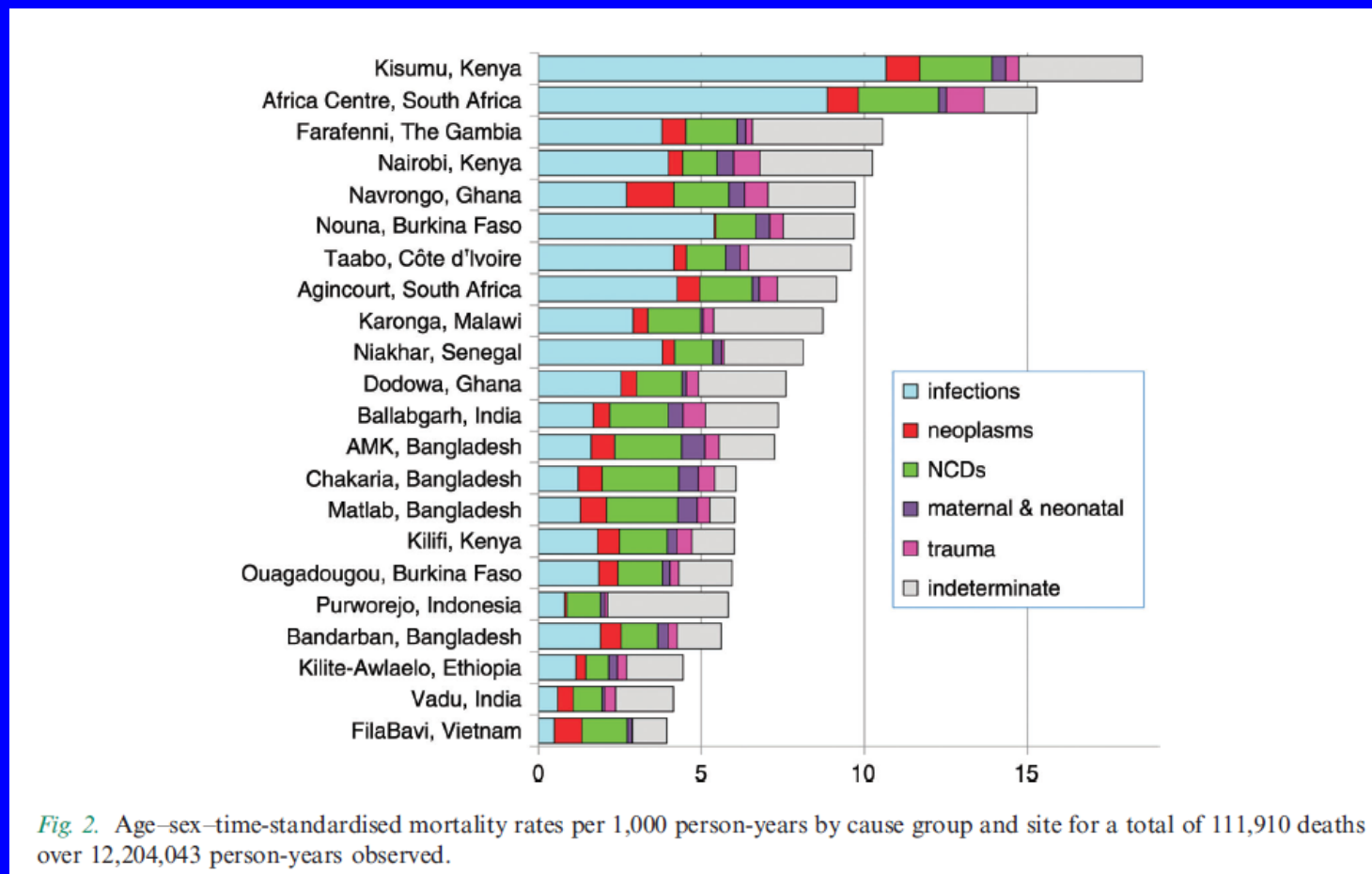
Global burden of disease



<http://www.starwars.com/databank/>



All cause mortality 1992-2012, 22 African and Asian countries

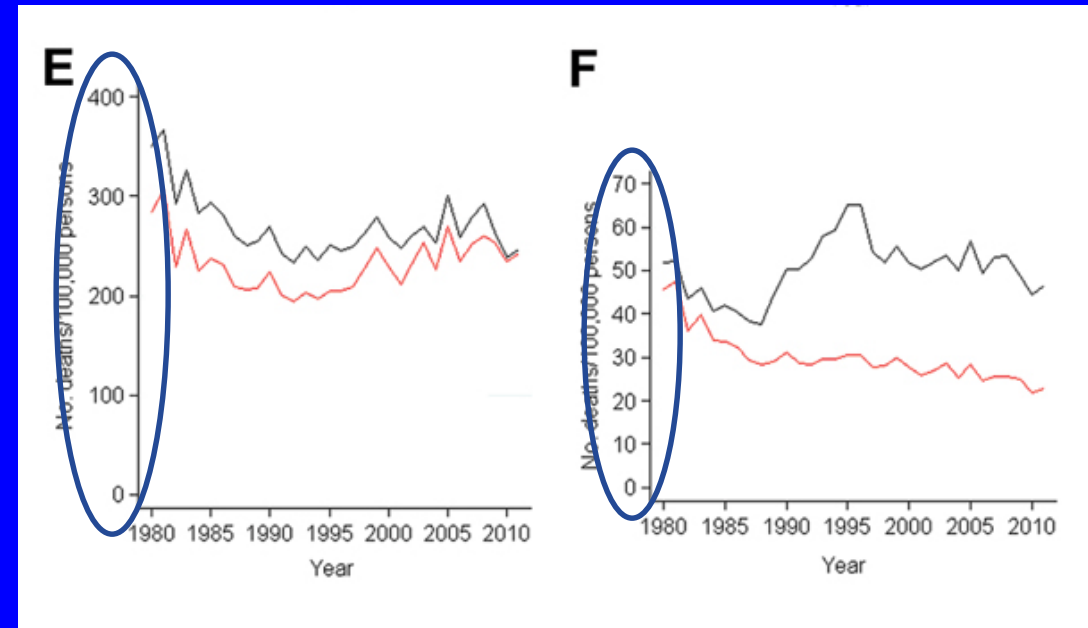


Streatfield et al. Global Health Action 2014;7:25362.



Elderly more likely to die from infectious diseases

- ID deaths in Spain, 1980-2011
 - 49% decline in deaths
 - 53.8 to 27.3/100,000
 - 2011, 247.1 deaths/100,000 in ≥ 65
 - 30 times ≤ 4 year olds
 - 9 times 45-64 year old
 - 58% of deaths due to influenza, pneumonia, acute respiratory infection, and septicemia



E) >65 years old

F) all ages

López-Cuadrado. Emerg Infect Dis 2014; 20 (5): 783.



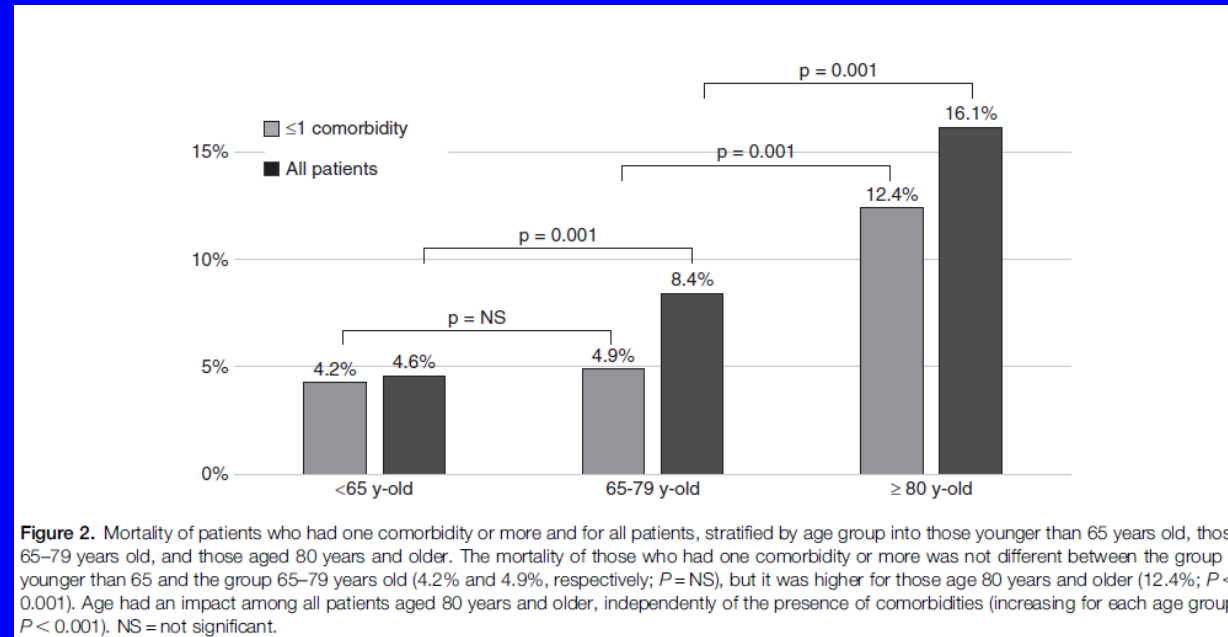
Double burden and the elderly

- Study of acute respiratory infections (ARI) in 3927 UK adults (median age 73 years old), 2003-9
 - Acute myocardial infarctions (AMI) were 4 times more likely in 1-3 days after diagnosis of ARI
 - Highest risk during peak influenza season and for those ≥ 80 years old
 - Warren-Gash. J Infect Dis 2012;206:1652.
- 364 hospitalizations for AMI in Ontario, 2009-14 (median age 77)
 - AMI 6 times more likely in the week following documented influenza infection
 - Kwong. N Engl J Med 2018;378:345.



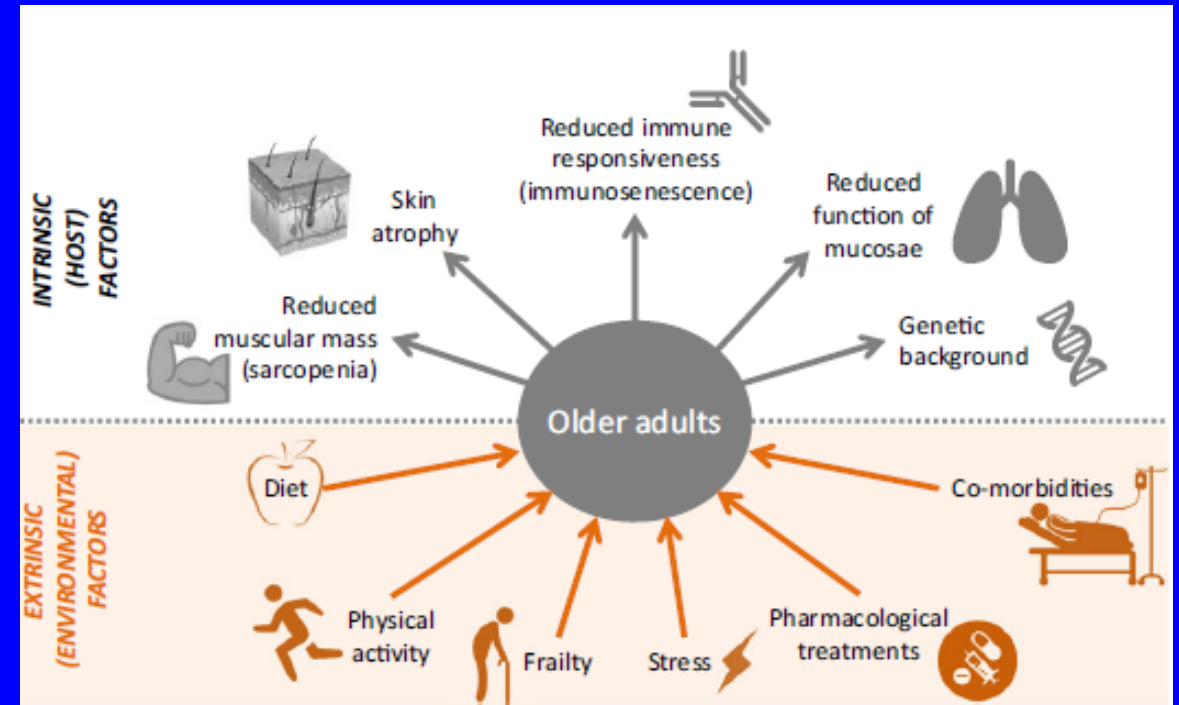
Triple burden

- 6,205 community-acquired pneumonia deaths from 17 countries, 2001-11
 - Age and ≥ 1 comorbidity associated with mortality
 - Luna. Ann Am Thorac Soc 2016; 13(9): 1519–1526.

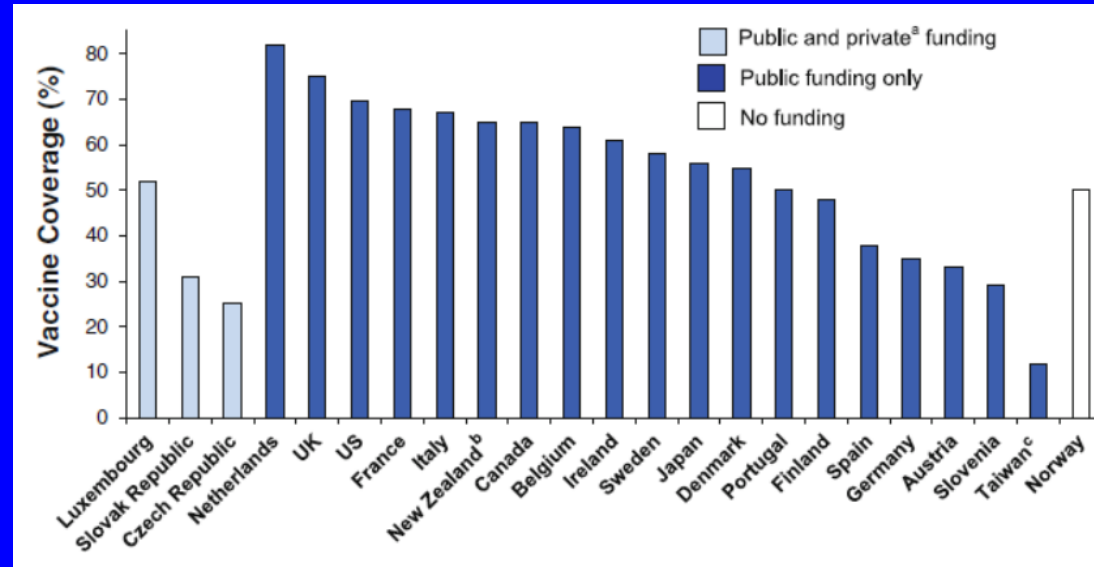


T-cells, B-cells and knees

- Immunosenescence
 - ↓ naïve T- & B-cells
 - ↓ T-cell receptor repertoire & memory B-cells
 - ↑ pro-inflammatory cytokines
 - IL-15, IL-6, IFN- γ and TNF- α
 - ↓ macrophages activation of adaptive immune response
 - Del Giudice. npj Aging and Mechanisms of Disease 2018; 4:1.



Influenza vaccination for ≥ 65 year olds vs measles in ≤ 1 year olds



Wu. Int J Public Health
2013;58: 865.

- Countries achieving 1st dose Measles vaccine, 2016
 - 76% Low-income
 - 81% Lower middle income
 - 94% Upper middle income
 - 94% High-income
- <http://apps.who.int/gho/data/view.main.81100WB?lang=en>



Future needs

- Better vaccines
 - Higher antigen (influenza)
 - Adjuvants
(Zoster/influenza/Pneumococcus)
 - New delivery systems
 - Del Giudice. 2018; 4:1.
- Better health care systems
 - Prince. Lancet 2015; 385: 549.
- Better policies

