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Global epidemiology of serogroup Y invasive meningococcal disease: A literature review

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Introduction

- Invasive meningococcal disease (IMD) is associated with substantial morbidity and mortality worldwide and five serogroups (A, B, C, W, Y) are responsible for about 96% of IMD cases.
- The epidemiology of *N. meningitidis* is unpredictable over time and across geographic regions. Recent surveillance reports indicated an increase in incidence of serogroup Y IMD in Europe. Information on serogroup specific incidence and its relative distribution among all IMD is important when considering meningococcal immunization policies.
- We conducted a systematic literature review to assess the burden of serogroup Y IMD (IMD-Y) worldwide since 2010.

Methods

- Through Embase and Medline, published studies between January 1 2010 and April 23 2019 and publicly available national and international surveillance reports for the years 2010 - 2018 were screened.
- Inclusion: Observational studies, national surveillance reports that detailed incidence and/or proportion of serogroup Y among all IMD. No restriction was made regarding clinical diseases, symptoms or diagnostic methods made for meningococcal isolates and serogroup identification.
- Exclusion: Clinical trials, modelling, case-control studies, papers where serogroup Y was not reported or data not extractable.
- Results are categorized by geography and by age groups.

Results

- 105 papers from Europe (28), Australia (21), North America (20), Africa (15), Asia (12), Latin America (9); 83 surveillance reports are analyzed (Fig. 1).
- Serogroup Y was not tested for in early 2010 studies in Africa and Asia.
- Incidence of IMD-Y: Generally low (<0.1/100,000 population) for most countries but represented up to 10% of all IMD in all ages.
- % of IMD-Y among all IMD: Highly variable. High rates in the United Stated (low incidence) and Northern Europe; in >50 years old (Fig 2).
- Reported IMD-Y cases: Large decrease in the United States (MenACWY use since 2005). Increased followed by recent decrease in the United Kingdom (MenACWY use since 2015). Increase in Australia and Europe (data not shown) and >65 years are the most affected among all IMD-Y (Fig 3)

Figure 1: Inclusion flow chart

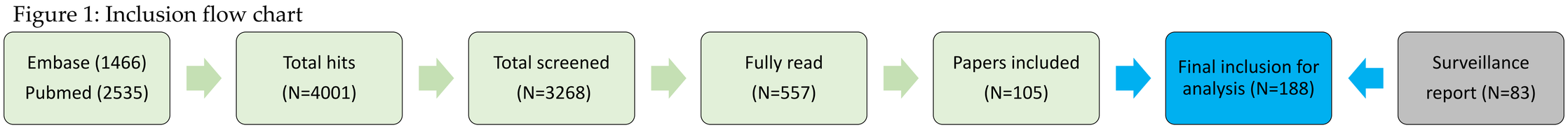


Figure 2: Trends and Proportion (%)* of serogroup Y among all IMD in all ages (otherwise specified) in selected coutries / regions

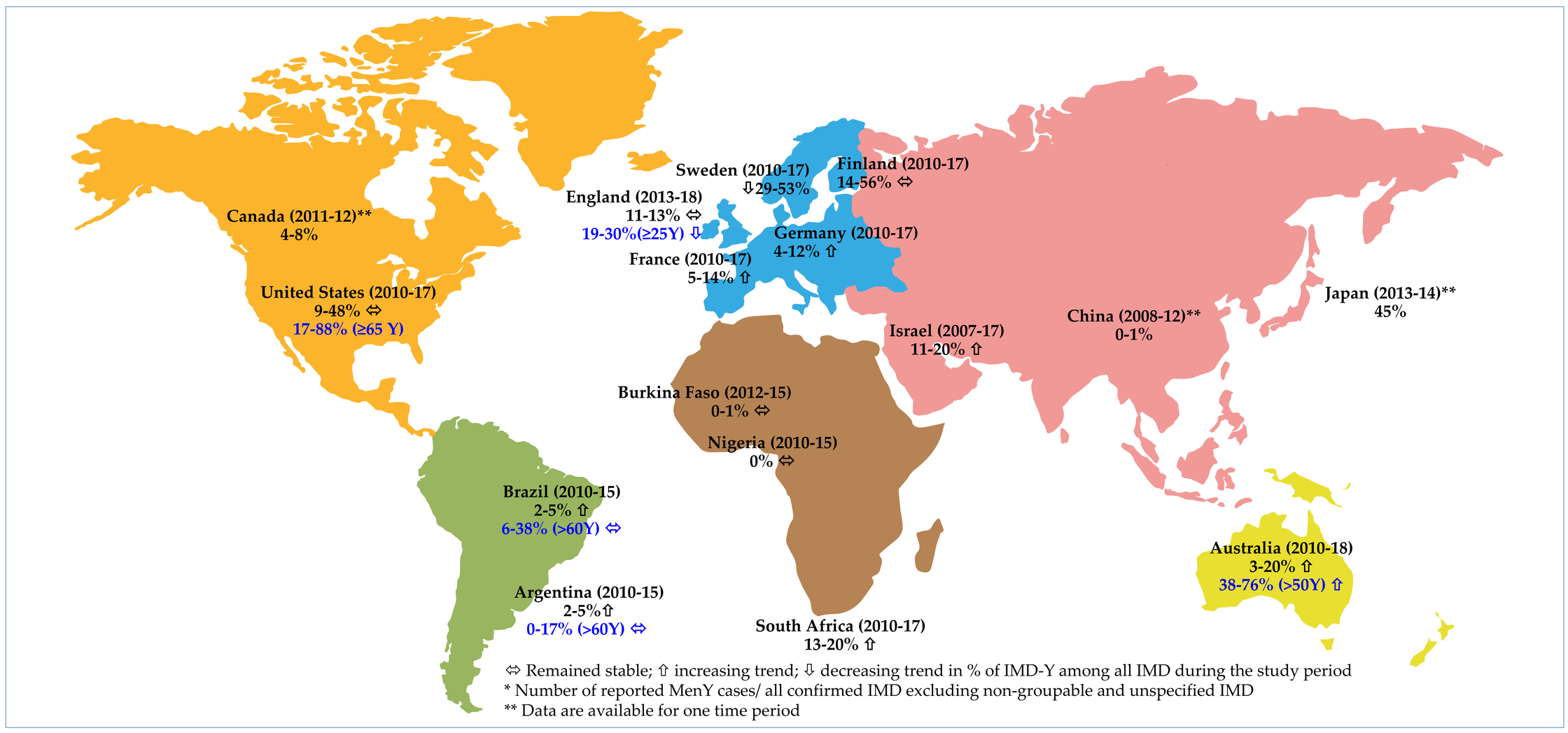
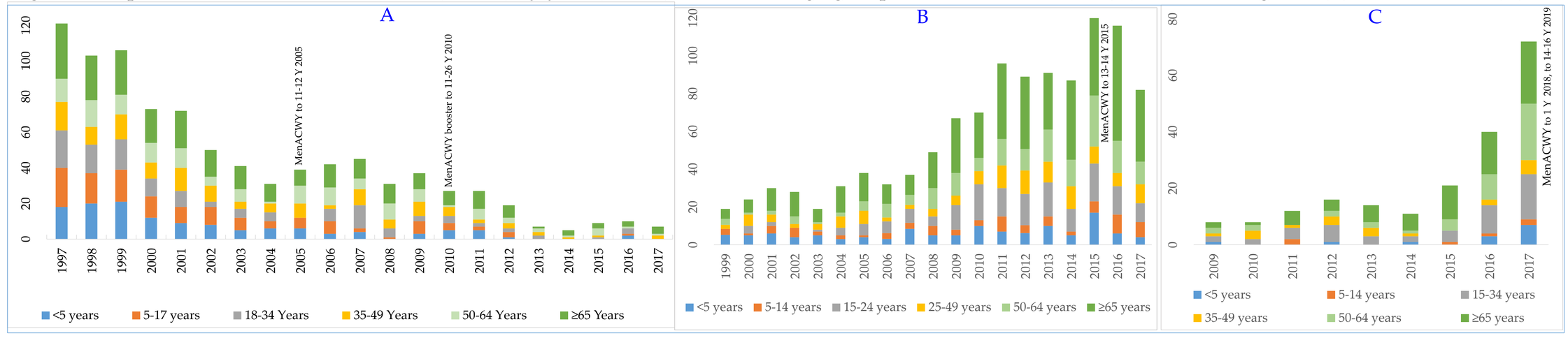


Figure 3: Reported number of IMD-Y cases (Y-axis) by year (X-axis) in different age groups in the United States (A), United Kingdom (B) and Australia (C)



Discussions and Conclusions

- Recent increases in IMD-Y cases in young adults and older age groups, observed in countries that do not vaccine against serogroup Y, warrants close surveillance. Because IMD-Y cases often present without meningitis. Surveillance of meningitis cases may represent an underestimate of the true burden.
- Significant benefits of MenACWY vaccine were observed in the United States with cases decreasing to <20 cases per year in the last 5 years. MenACWY vaccine recently replaced MenC vaccine in the UK, Spain as adolescent program and Netherlands, Australia as toddlers and adolescent program.
- IMD-Y emergence may necessitate a revision of meningococcal immunization policies.

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