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Viral Hepatitis Prevention Board

Population based research on the evidence for vaccination once in a lifetime

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Conflict of interest

- I work daily on the Region of Murcia's Vaccination Program, in constant contact with various pharmaceutical laboratories.
- I have received and continue to receive support for conferences and training meetings from the pharmaceutical industry, as well as fees for consulting and support for various research projects.

Criteria for modifying the vaccination schedule in Spain

SA1



- **Burden of disease (Severity and magnitude of the problem)**
- **Vaccine effectiveness and safety**
 - Clinical trial data and real-world evidence are evaluated regarding **efficacy, immunogenicity** (the ability to trigger an immune response), and the **duration of protection**.
- **Impact of the vaccination program**
 - This involves studying the logistics and operational impact: scheduling complexity, number of doses, route of administration, cold chain requirements, and potential effects on overall vaccine coverage rates.
- **Ethical and social aspects**
- **Economic evaluation (Cost-effectiveness)**

But sometimes...

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SA1 recommendations...
Anis, Sameh; 2025-10-16T07:35:03.141

SA2 Recommendations refer to the official recommendations for a specific group by a national health body.
Anis, Sameh; 2025-10-16T07:36:32.080



What proportion of people must have an indication based on special characteristics (travel, occupational health, risk groups) for the recommendation to shift from specific to universal?

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HEPATITIS A VACCINATION: UNIVERSAL OR RISK-BASED STRATEGIES?

SA1



- **Main objective:**
- To estimate the cumulative probability of meeting indications for HAV vaccination over the lifetime of individuals residing in Spain who reach 60 years of age in 2025
- **Secondary objectives:**
- Assess the prevalence of individual risk-based indications and to characterize lifetime exposure to these factors, with the aim of informing the potential need for a shift toward broader vaccination strategies

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METHODS

SA1



- Four predefined categories of HAV vaccination indications
 - travel-related
 - Occupational
 - lifestyle/behavioral
 - health-related
- Consistent with recommendations from the Spanish NITAG and complemented by additional risk groups included in international guidelines

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DATA SOURCES AND VARIABLE DEFINITIONS

SA1



- Data were obtained from publicly available national and international sources, including governmental databases, epidemiological reports, and peer-reviewed studies. Whenever possible, prevalence estimates were derived from population-based data representative of the Spanish population or, when unavailable, from comparable low-endemicity settings.
- Travel exposure risk was taken based on a specific survey

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ESTIMATION OF INDIVIDUAL PROBABILITIES

SA1



- When multiple sources were available, priority was given to the most recent and nationally representative estimates. In cases where only subgroup data were available, estimates were extrapolated to the general population using demographic proportions. All probabilities were expressed as proportions of the total population

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STATISTICAL MODELLING

SA1

- The objective of the study was to calculate the pooled risk of having an indication for HAV vaccination in a person who reaches the age of 60 in Spain in 2025, based on the prevalence of different indications for HAV vaccination and their lifetime exposure to these indications. Due to the interconnected nature of the various risk factors associated with HAV, direct calculation of their respective risks was not feasible. Instead, the general joint probability formula must be utilized to derive the aggregate risk estimate:



SA2

$$P(A_1 \cup A_2 \cup \dots \cup A_N) = \sum_{i=1}^N P(A_i) - \sum_{1 \leq i < j \leq N} P(A_i \cap A_j) + \\ + \sum_{1 \leq i < j < k \leq N} P(A_i \cap A_j \cap A_k) - \dots + (-1)^{N+1} P(A_1 \cap A_2 \cap \dots \cap A_N)$$

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STATISTICAL MODELLING: DIFERENT VARIABLES

SA1



- **Method 1: Complete independence**
 - At least not known dependence, for example liver disease and working with exposition to Hepatitis A Virus
- **Method 2. Partial dependence (documented overlaps)**
 - For example, MSM and HIV infection

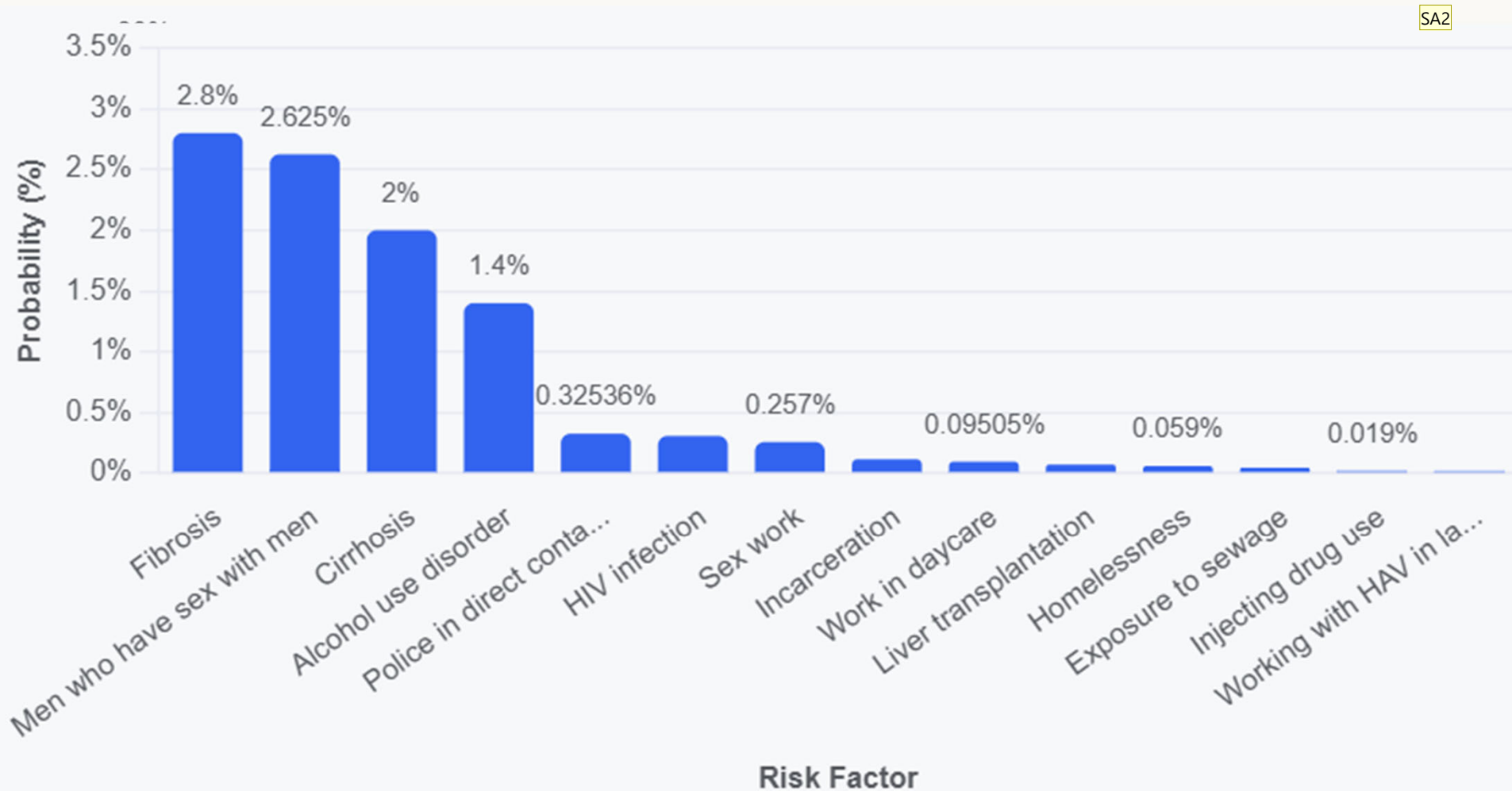
Different statistical treatment for both cases

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CATEGORIZATION OF HA RISK FACTORS AND PROBABILITY OF MEETING HAV VACCINATION INDICATION



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POOLED PROBABILITY OF MEETING HAV VACCINATION INDICATIONS UNDER DIFFERENT ANALYTICAL MODELS AND SENSITIVITY ANALYSES



OUTCOME	MODEL/APPROACH	ESTIMATE (%)	SENSITIVITY ANALYSIS (±10%)
≥1 <u>indication (Spanish NITAG criteria)</u>	Independence <u>model</u>	77.18	71.51 – 82.52
≥1 <u>indication (Spanish NITAG criteria)</u>	<u>Overlap-adjusted model</u>	75.00	69.91 – 79.57
≥1 indication (expanded criteria, CDC-aligned)	Independence <u>model</u>	77.23	71.57 – 82.47
≥1 indication (expanded criteria, CDC-aligned)	<u>Overlap-adjusted model</u>	74.83	69.78 – 79.33
≥2 simultaneous indications (Spanish NITAG and expanded criteria, CDC aligned)	<u>Poisson-binomial approximation</u>	24.70	18.70 – 27.10

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POSSIBLE EXAMPLES AND DISCUSSION

SA1



- In pneumococcal disease, the United States expanded vaccination to all individuals aged 50–64 years, based on estimates showing that 32%–54% of this age group met criteria for risk-based vaccination
- We have multiple recommendations but would be easier to make a universal recommendations for children:
 - Of course depending on the duration of protection
 - And how the risk factors will evolve in the future (although it doesn't look like it's going to subside)

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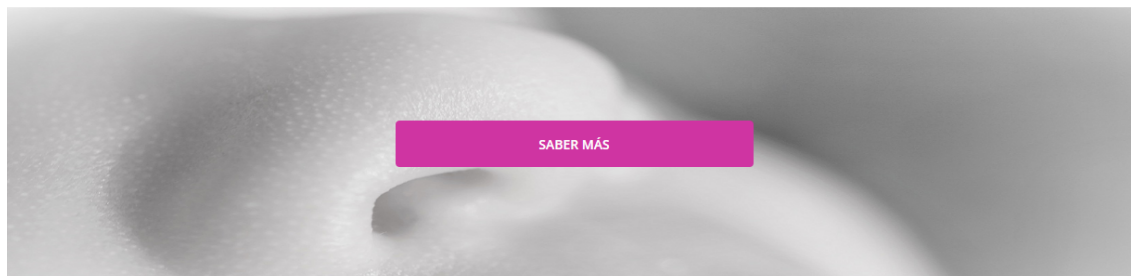
Instead of To take home...
We are open to comments



SA1

SA1 are

Anis, Sameh; 2025-10-16T07:53:01.736



THANK YOU VERY MUCH

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