Greek MSM: 95-95-95 Target is not Enough to Meet the HIV Incidence Reduction Goal

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BACKGROUND

- UNAIDS modeling predictions suggest that the 95-95-95 target could reduce the HIV incidence worldwide by **90% in 2030 compared to 2010.**
- Several studies have underlined that in high-income countries, HIV cascade of care (CoC) targets may be **insufficient to achieve the incidence goal.** Additional interventions, like pre-exposure prophylaxis (PrEP), will be needed.
- In Greece, HIV infection **is more prevalent among men who have sex with men (MSM),** accounting for about half of all annual diagnoses.
- MSM in Greece have almost achieved the UNAIDS 90-90-90 target (89%;91%;92%; Nat. Public Health Institute).
- **Study aims** a) to estimate the expected reduction in HIV incidence under the status quo scenario by 2030 and b) to investigate the required healthcare interventions to achieve the UNAIDS incidence goal by 2030.

METHODS

- A previously published mathematical model was used to simulate HIV transmission among MSM[1] (**Fig. 1**).
- The population was further stratified by risk behaviour group according to the Greek EMIS study[2] (**Table 1**).
- We assumed that only high/medium MSM could be infected**.**

Figure 1: Schematic outline of the mathematical model

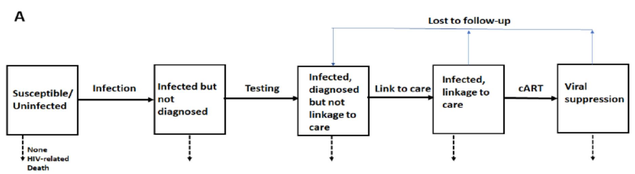


Table 1: Risk behaviors distribution of Greek MSM (EMIS)

How often were condoms used when you had intercourse with non-steady male partners?	Risk Group	Percentages
Never	High	4,20%
Seldom	High	3,90%
Sometimes	High	7,00%
Mostly	Medium	28,60%
Always	Low	56,00%

Reaching the 95-95-95 target among Greek MSM in 2030 would not be enough to reduce HIV incidence by 90%.
To achieve the HIV incidence elimination goal, in addition to PrEP delivery to all high-risk people, primary preventions to medium risk MSM are also need.

- The model was calibrated to match the trajectories of the Greek HIV CoC in the years 2013, 2016, 2019, and 2020. People were allowed to move across risk groups.
- **The infection rate, the probability of being diagnosed, and the probability of ART initiation varied until the model reproduced the observed HIV epidemic of Greece**.
- Currently (**status quo**) PrEP is not available in Greece.
- **PrEP only scenario (S1)**: All high risk MSM start gratually PrEP over 3 years. PrEP discontinue if not high risk. **S1+primary prevention scenario (S2):** All medium risk MSM move to low risk.

RESULS

- Under the status quo scenario, Greek MSM **would achieve the 95-95-95 target of 2030** (Fig. 2).
- However, this **would not be enough to achieve the 90% reduction in HIV incidence** (estimated reduction of 32.4% in 2030 compared to 2010; Fig. 3).

Figure 2: Model predictions regarding the future HIV CoC under base case scenario

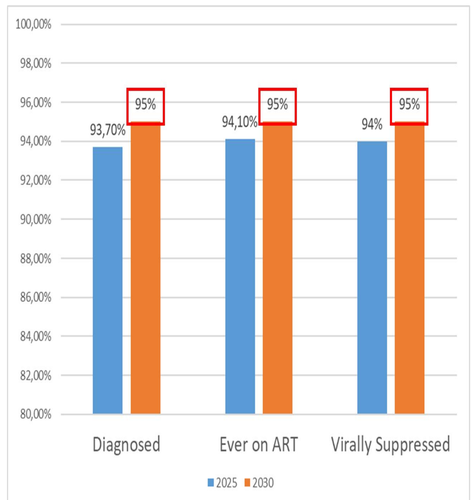
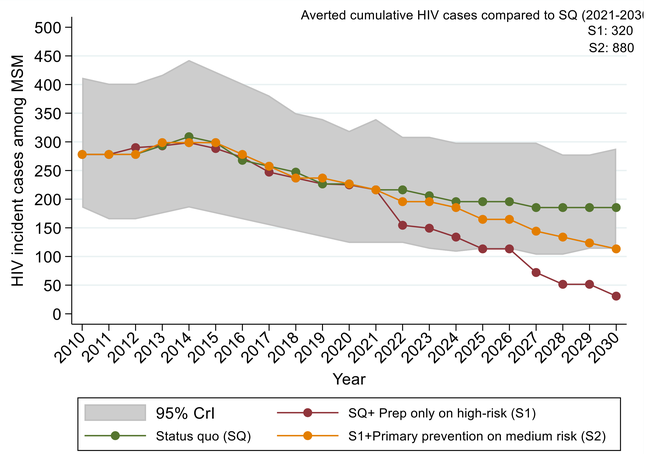


Figure 3: Model predictions for HIV incident cases by the 3 different scenarios. Shaded grey error bars: 95% CrI of the status quo scenario



- Launching a PrEP intervention only for the high-risk MSM, without any other interventions, **would cause a modest incidence reduction** (58% in 2030 compared to 2010; Fig. 3).
- To achieve HIV elimination in 2030, the 95-95-95 target should be achieved, **all high-risk MSM should be on PrEP (within 3 yrs.), and medium-risk MSM should move to low-risk MSM (within 4 yrs.)**

CONCLUSIONS

- Mathematical models can contribute to the development of an evidence-based strategy for HIV elimination.
- If the HIV public health response remained the same, **Greek MSM could reach the 95-95-95 target, but would not achieve the 90% reduction in HIV incidence by 2030.**
- To achieve HIV elimination, in addition to reaching the 95-95-95 target, **PrEP delivery to all high-risk MSM, and primary preventions among medium-risk MSM should be implemented to shift to low risk.**
- **Awareness campaigns** should be implemented so all high-risk MSM be on PrEP by 2030

References

1. Gountas I, et al. Could the 2010 HIV outbreak in Athens, Greece have been prevented? A mathematical modeling study. *PLoS ONE*. 2021;16(10): e0258267.
2. Pantavou et al. Key Findings from the European Men-Who-Have-Sex-With-Men Internet Survey in Greece. Epidemiologia 2021

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