

# Routine HIV screening in Portugal: clinical impact and cost-effectiveness

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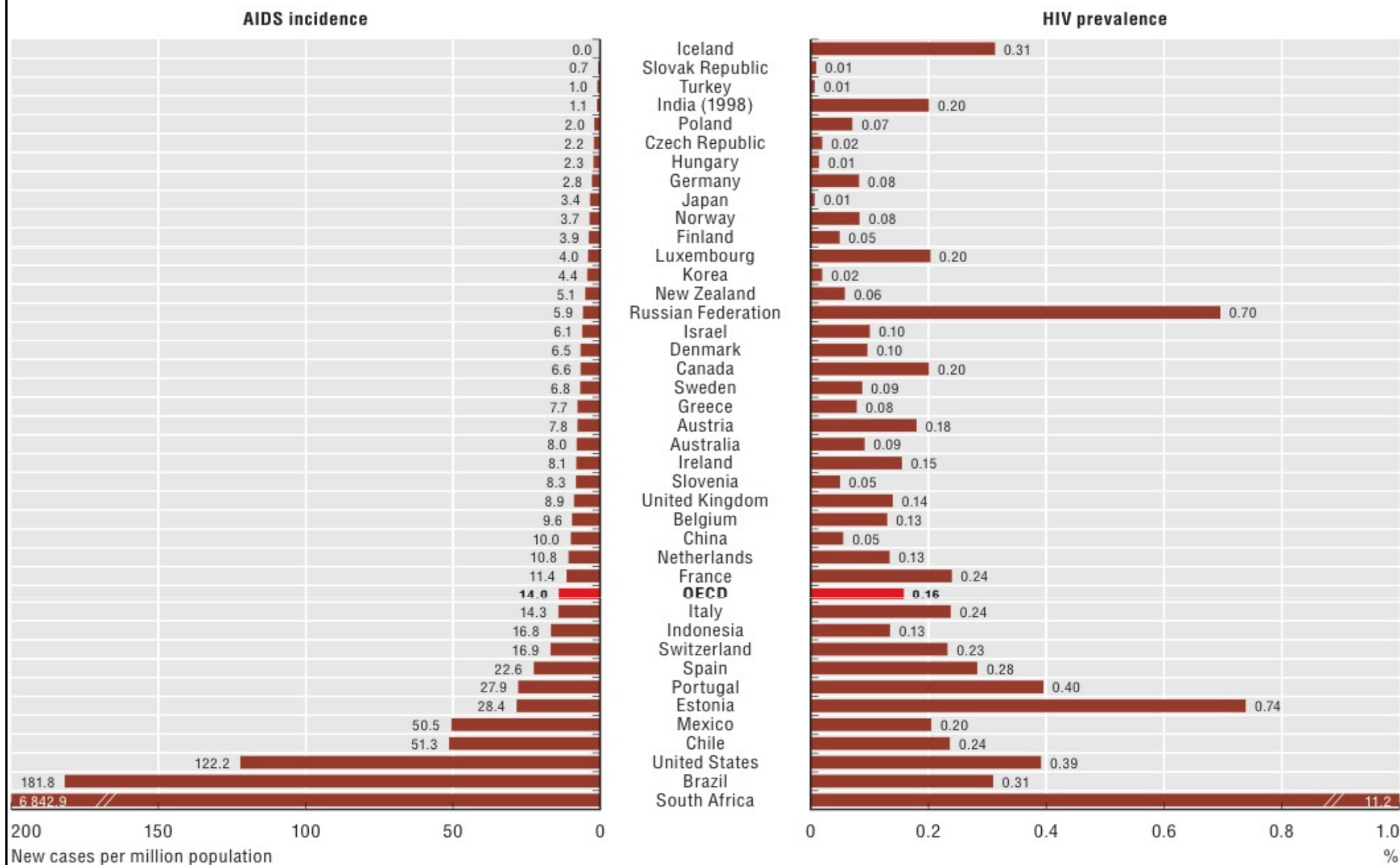
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# Rationale for expanded HIV testing in Portugal

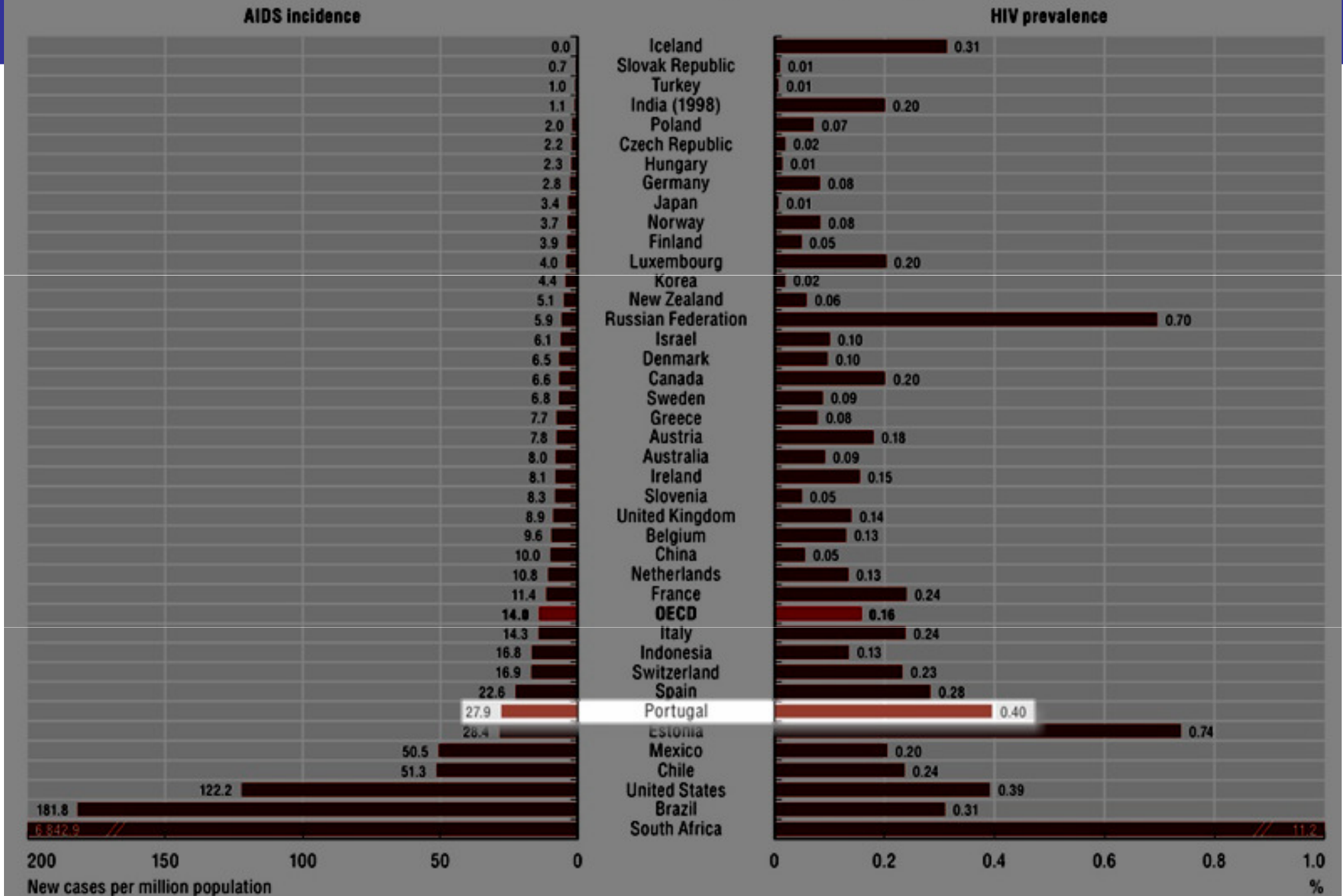
- 39,347 diagnosed cases out of 10 million people (2010)
- 2008 estimated diagnosed prevalence, 18-69 yrs: 0.37%
- 2,356 new HIV/AIDS cases identified in 2001
- 2,184 new HIV/AIDS cases identified in 2010
- Mean CD4 at care initiation: 292 cells/ $\mu$ L

# AIDS incidence and estimated HIV prevalence, 2009 (or nearest year)



Source: *Health at a Glance*, OECD, 2011

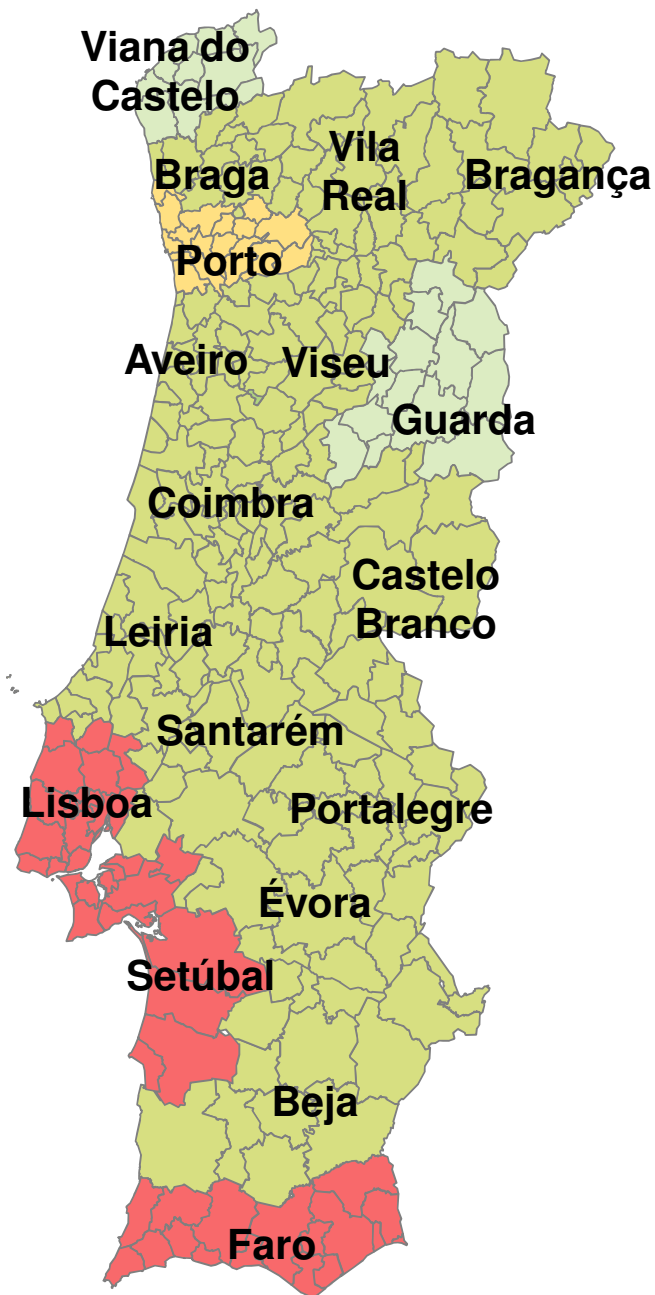
### 1.12.1 AIDS incidence and estimated HIV prevalence, 2009 (or nearest year)



Source: *Health at a Glance*, OECD, 2011

# Undiagnosed prevalence

# Yearly incidence



# Rationale for expanded HIV testing in Portugal

Portuguese health system provides strong support for HIV testing and care:

- Universal coverage with low co-payments
- Free access to test and ART at NHS institutions
- National network of primary care centers
- *Pay-for-performance* at primary care centers: financial rewards based on 1y and 2y prevention

# Rationale for expanded HIV testing in Portugal

## Proposal for an expanded HIV screening strategy in Portugal

- Voluntary testing at all health care settings as part of routine care
- Population-based provider-initiated test (rapid test)
- Counselling for positive cases (opting-out) and linkage to care

## Challenge: context of financial crisis

- 2010 Portuguese GDP/capita (ppp): 19,500€ (mean 2010 EU GDP/capita: 24,400€)
- 2011 GDP growth rate of GDP: -1.5%
- 2010 public budget deficit: 9.8%

# Objective

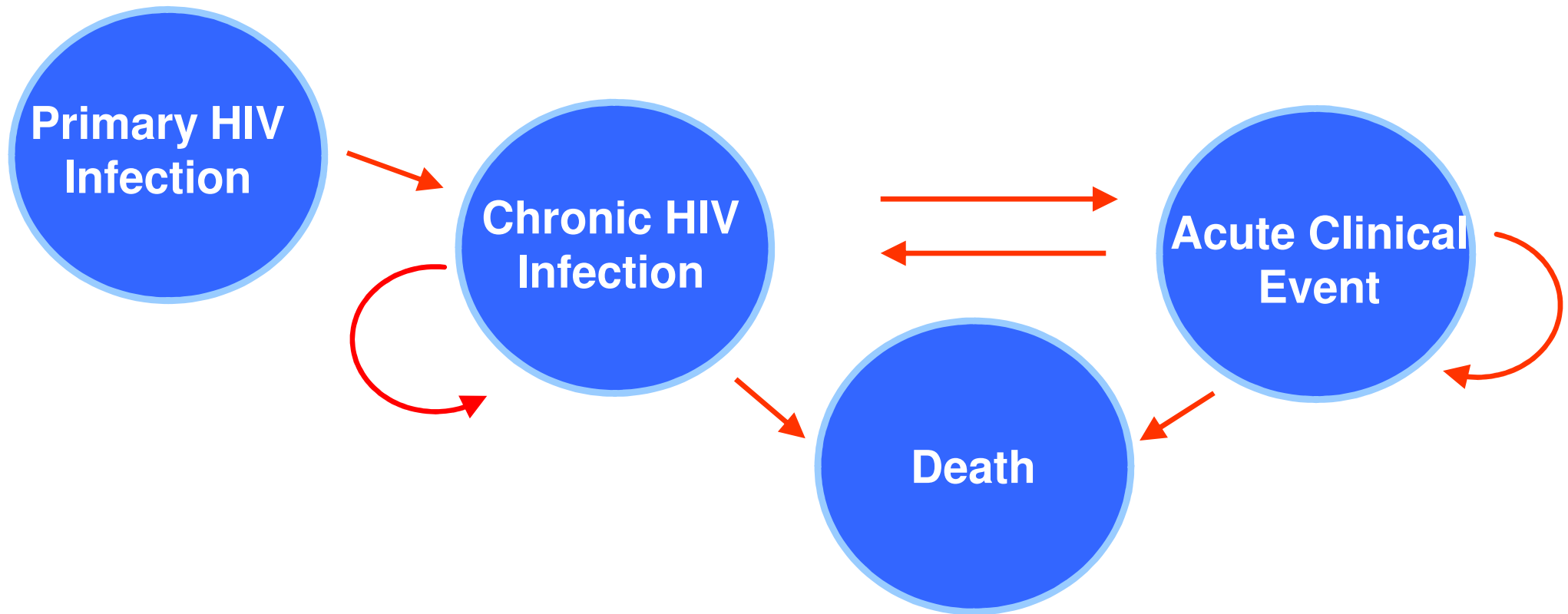
- To forecast the clinical impact and cost-effectiveness of different national routine HIV screening strategies in Portuguese adults:
  - One-time screening
  - Screening every 3 years
  - Annual screening
- To account for regional heterogeneity in burden of disease



# Methodology: CEPAC Simulation Model

- Widely published CEPAC (Cost-Effectiveness of Preventing AIDS Complications) Monte Carlo simulation model of HIV acquisition/detection/care
- Use to compare proposed routine screening strategies to current risk-factor-based screening
- The model captures data on:
  - HIV screening: HIV prevalence and incidence, test offer/acceptance rates, returns for test results, linkage to care, and HIV counseling and testing costs
  - HIV disease: incidence of opportunistic diseases, HIV ART and OI treatment, mortality rates, and associated costs and quality of life effects

# Methodology: CEPAC Simulation Model



# Methodology: CEPAC Model Input Parameters

Variable	Value	Reference
Undiagnosed HIV prevalence	0.16%	INSA 2010, Haemers & Philips, <i>HIV Med</i> , 2008
Annual incidence	0.02%	INSA 2010
Test offer/acceptance rate	60%	Assumption + Jauffret-Roustide, <i>BEH</i> , 2006
Linkage to care rate	78.4%	Portuguese CAD Report, 2010
Mean CD4 at care initiation	292 cells/ $\mu$ L	2010 survey at Portuguese hospitals
HIV Rapid Test Cost	5.4€	Ordinance 839-A/2009
Treatment Cost		Survey at 5 Portuguese hospitals

# Outcomes Examined

- Projected life expectancy
- Projected quality-adjusted life expectancy
- Costs
- Incremental cost-effectiveness
  - Portuguese Infarmed “informal rule” for cost-effectiveness of innovative drugs: 30,000 €/QALY
  - WHO standard for “cost-effective” is  $<3 \times \text{GDP/cap.}$   
= 48,600 €/QALY in Portugal

(Portuguese GDP/capita, 2010: 16,200€)

# National Base Case Results (Undiagnosed Prevalence = 0.16%, Annual Incidence = 0.02%)

Testing strategy	Quality-adjusted life months HIV-infected <sup>1</sup>	Quality-adjusted life months total population <sup>1</sup>	Costs (€) <sup>1,2</sup>	ICER (€/QALY) <sup>3</sup>
Current practice	174.63	193.07	720	---
Screen once	177.02	193.09	780	39,800
Screen every 3 years	179.28	193.11	870	62,400
Screen annually	181.07	193.12	980	110,500

1. Costs and quality-adjusted life months discounted at 5% per annum.
2. Costs rounded to nearest 10 €.
3. ICERs are for the general population and are rounded to nearest €/QALY.

# Lisbon Base Case Results (Undiagnosed Prevalence = 0.29%, Annual Incidence = 0.04%)

Testing strategy	Quality-adjusted life months HIV-infected <sup>1</sup>	Quality-adjusted life months total population <sup>1</sup>	Costs (€) <sup>1,2</sup>	ICER (€/QALY) <sup>3</sup>
Current practice	174.46	192.82	1,300	---
Screen once	176.91	192.86	1,410	35,600
Screen every 3 years	179.12	192.89	1,560	54,000
Screen annually	180.93	192.92	1,710	65,200

1. Costs and quality-adjusted life months discounted at 5% per annum.
2. Costs rounded to nearest 10 €.
3. ICERs are for the general population and are rounded to nearest €/QALY.

# Beja Base Case Results (Undiagnosed Prevalence = 0.09%, Annual Incidence = 0.01%)

Testing strategy	Quality-adjusted life months HIV-infected <sup>1</sup>	Quality-adjusted life months total population <sup>1</sup>	Costs (€) <sup>1,2</sup>	ICER (€/QALY) <sup>3</sup>
Current practice	174.64	193.21	400	---
Screen once	177.12	193.22	440	51,700
Screen every 3 years	179.32	193.23	500	66,200
Screen annually	181.10	193.24	580	114,200

1. Costs and quality-adjusted life months discounted at 5% per annum.
2. Costs rounded to nearest 10 €.
3. ICERs are for the general population and are rounded to nearest €/QALY.

# Sensitivity analyses

- The results for one-time testing remained close to the WHO threshold for cost-effectiveness for the following parameters:
  - CD4 at care initiation ranging from 274 cells/ $\mu$ L - 371 cells/ $\mu$ L
  - Linkage to care rates ranging from 50% - 100%
  - Test acceptance rates ranging from 50% - 100%
  - Rapid test costs ranging from 2.7€ to 27€



# Sensitivity analyses

- The results for one-time testing exceeded the WHO threshold for cost-effectiveness for the following parameters:
  - Linkage to care rates below 50%
  - Test acceptance rates below 50%

# Main Limitations

- Conservative approach: disease transmission not accounted for that would make screening more cost-effective
- Results are robust when considering a wide range of prevalence and incidence estimates
- Analysis not focuses specific health care settings (e.g. ED, primary health care centers. Acute care units)
- Cost-effectiveness does not necessarily imply affordability: further steps include a budget impact analysis

# Summary

- One-time HIV screening of the general population
  - Increases quality-adjusted life expectancy
  - Meets WHO standards for cost-effectiveness
- Screening every 3 years in high-prevalence areas is close to WHO standards for cost-effectiveness
- One-time screening in lowest-prevalence areas is close to WHO standards for cost-effectiveness

# Policy Implications

- Programs to expand routine screening should be implemented to increase life expectancy
- Routine screen programs are cost-effective
- To promote sustainability, routine screening programs should be initiated in high-prevalence areas
- Cost-effectiveness of routine screening may improve when secondary transmission is considered

# Research Team

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