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Comparing Colorectal Cancer Screening Outcomes in the International Cancer Screening Network: A Consortium Proposal

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Disclosures

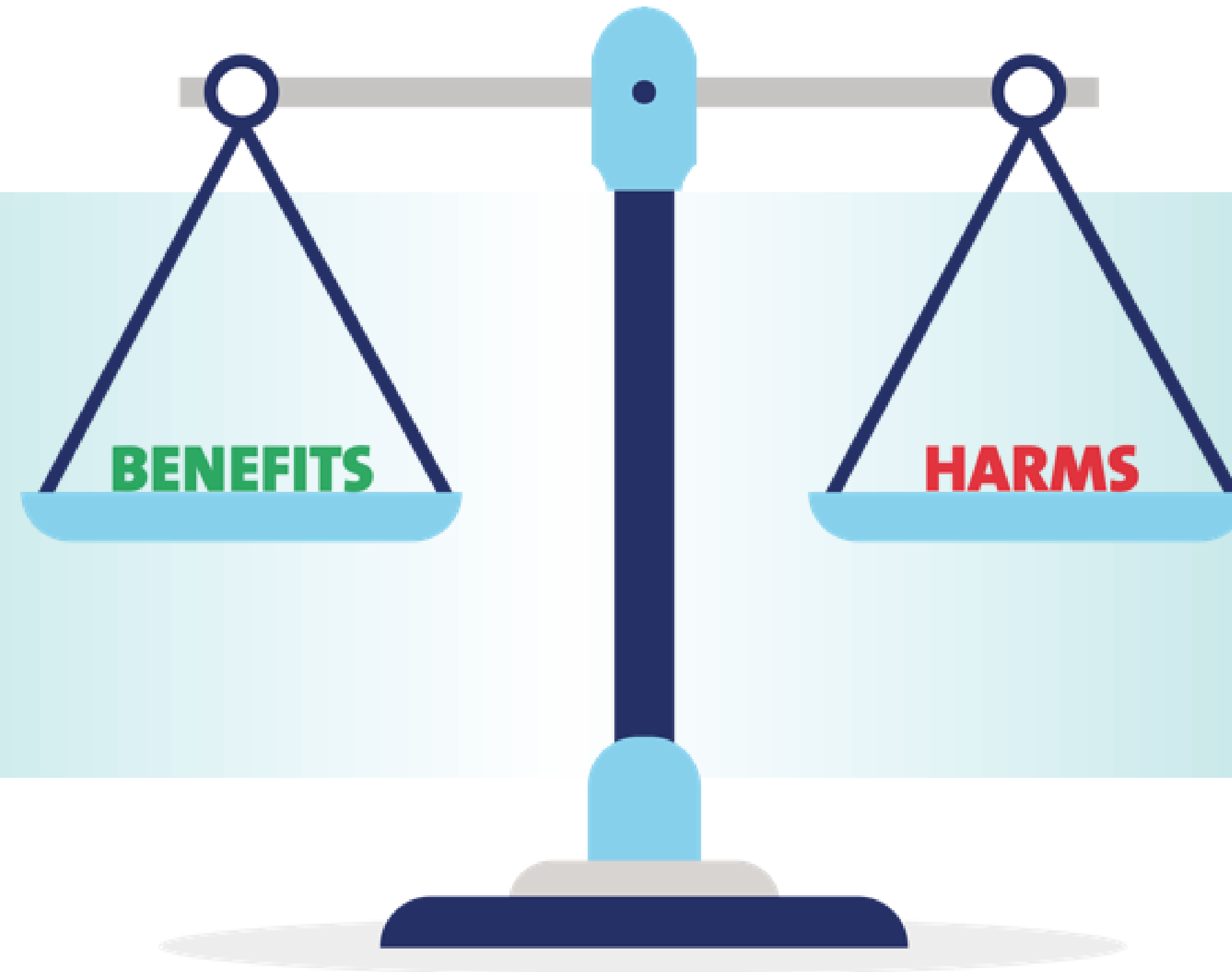
No conflicts to disclose



Balance between benefits and harms

- **Benefits**

Lower mortality
Lower morbidity



- **Harms**

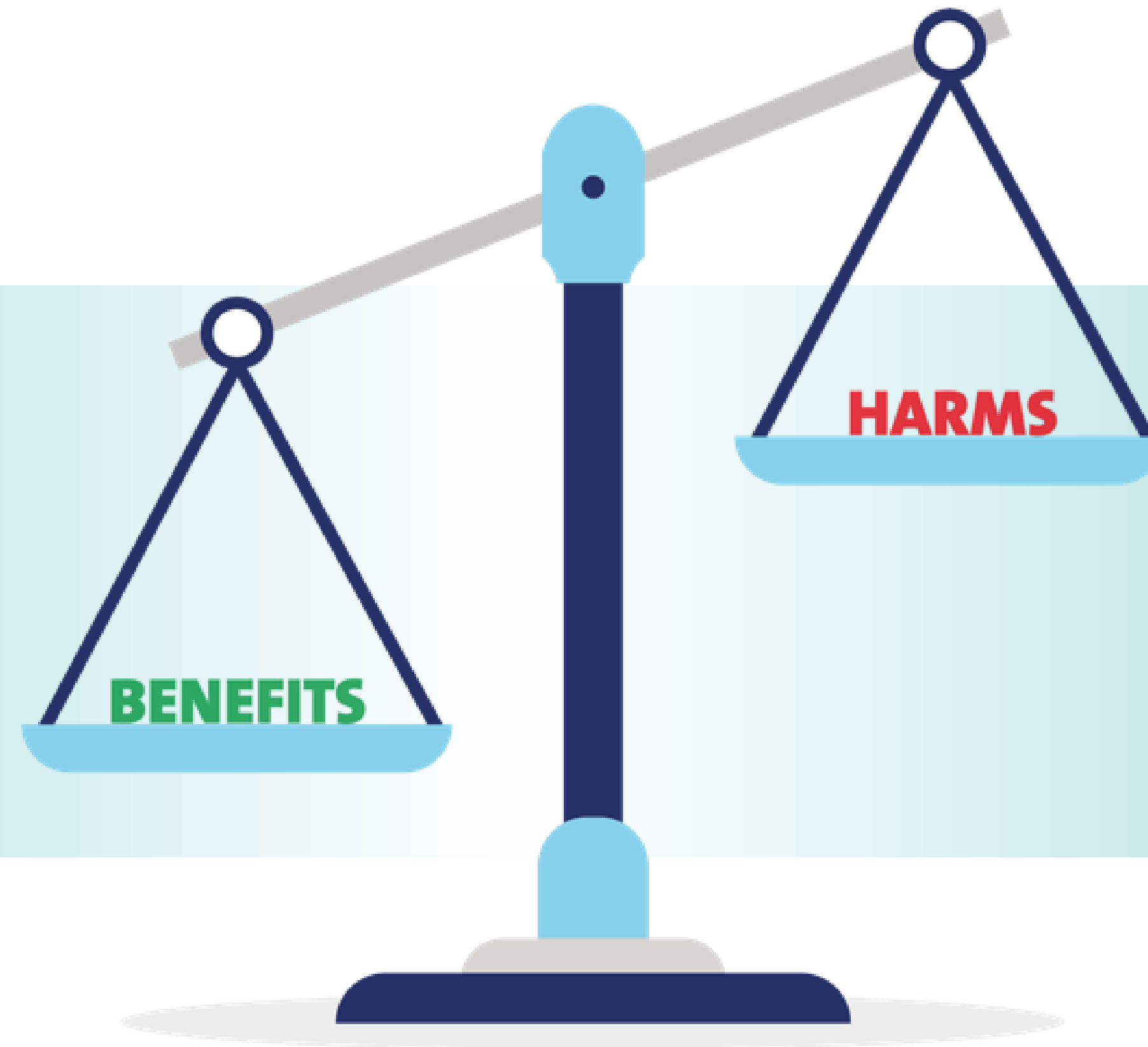
False-positives
Complications
Overdiagnosis



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- **Harms**

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Benchmarking as tool to improve balance

- Appropriate and valid comparisons across cancer screening programs are essential for policy and decision makers to evaluate and improve them
- Many initiatives aiming to collect data on cancer screening across countries exist:
 - Second report on cancer screening in EU
 - Cancer screening in five continents (CanScreen 5; IARC)
 - Towards improved cancer screening in all of Europe (EU-TOPIA; Horizon 2020)



Limitations to current approaches

- Time intensive
- Cross-sectional
- Usually presented for a single year of activity
- Unreliable comparisons for short-term outcomes across programs that adopt different protocols

→ longitudinal approach better than cross-sectional approach preferable when comparing programs



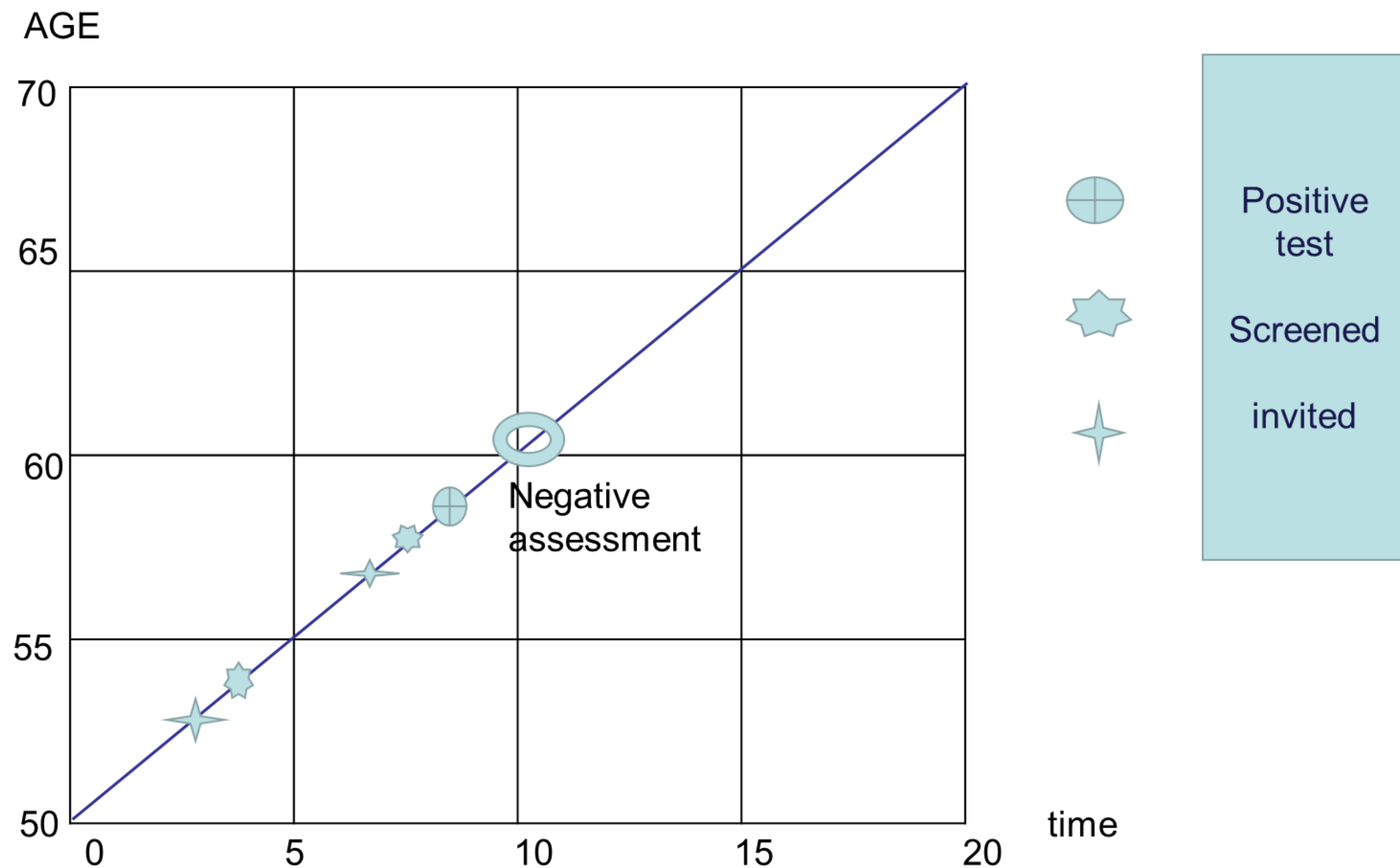
Comparability requirements



- Commensurable intervals: outcomes are not comparable without commensurable intervals and actual screening histories of eligible population.
- Appropriate interval could be 6 years for comparing outcomes of FIT every two years with FIT every three years; or 10 years for colonoscopy versus FIT.
- Actual screening histories: Individuals may not strictly respect established screening schedule; different screening tests may co-exist
- Recording of actual dates of events would measure correct intervals between events, classify events (type of test, blood concentration, type of lesion, etc) and the relevant related information.

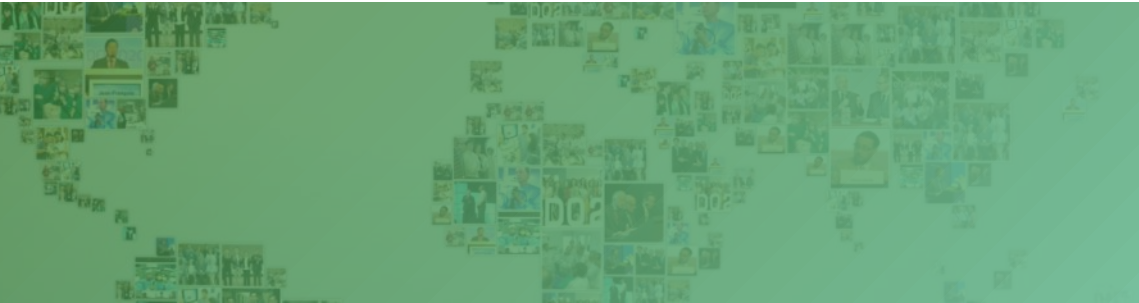


Graphical representation of individual screening history



Tabular representation of individual screening histories

Individual ID	Birth date	Sex	Screening round	Invitation date	Participation date	Test result	Date of diagnostic FU	Result diagnostic FU	Screening round	Invitation Date

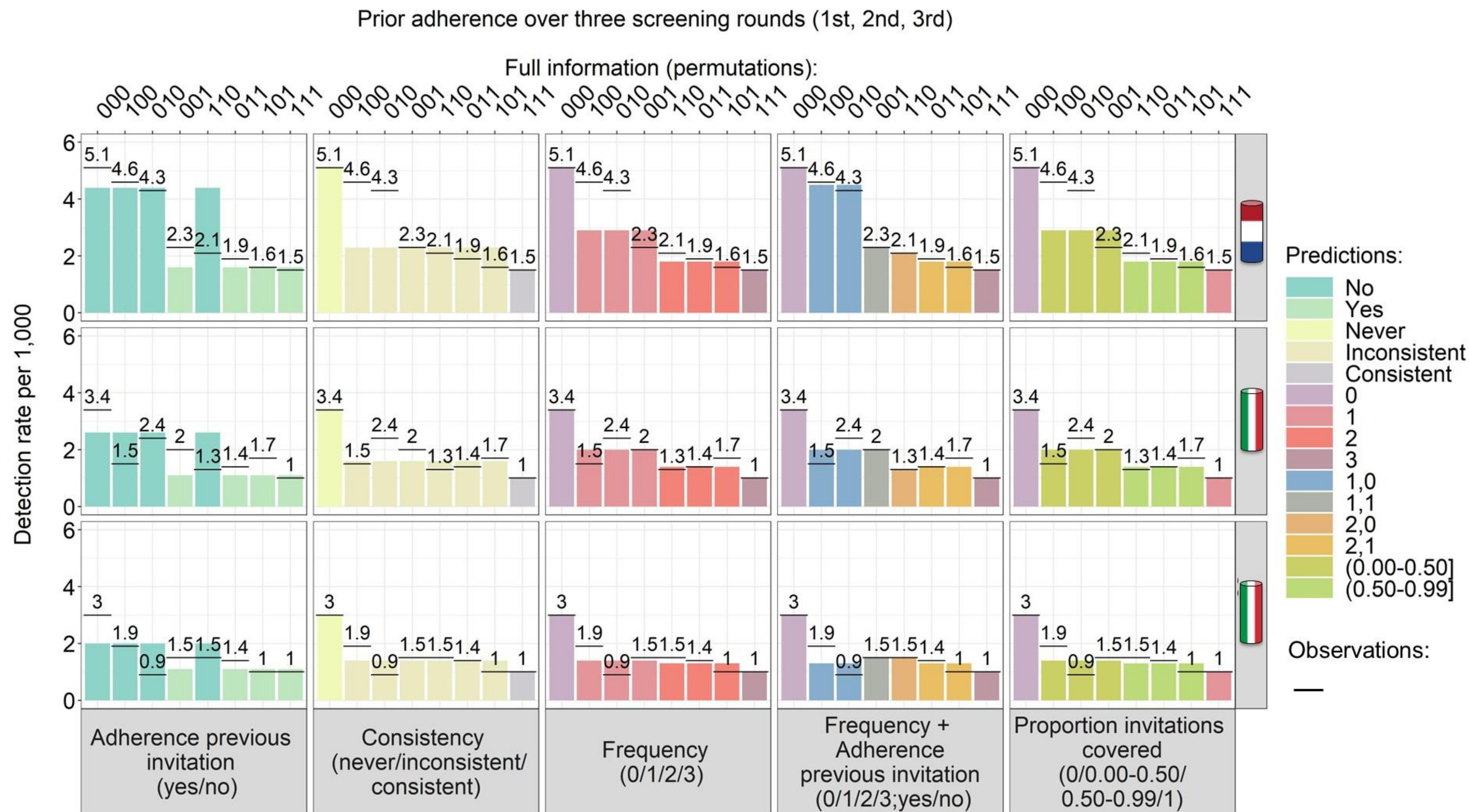


Example comparisons: longitudinal adherence

- Standardized analysis of longitudinal adherence on 3 different screening settings:
 - Dutch pilot studies: average 60% adherence
 - Piemonte screening programme: average 40% adherence
 - Emilio Romagna screening programme: average 65% adherence



Example comparisons: longitudinal adherence



De Jonge et al.,
poster DDW
2022

Figure 1 Estimates for AN detection in fourth round in the Dutch population-based CRC screening trial and two regions in the Italian CRC screening program for five simplified measures of longitudinal adherence.

Abbreviations: AN, advanced neoplasia; CRC, colorectal cancer. Note that 0's and 1's designate participation in prior rounds. E.g. 000 = no participation in any of the prior rounds. 110 = participation in rounds 1 and 2, but not in round 3.



Proposal for consortium

- Aim: to set up common individual-level database of screening histories from different colorectal cancer screening programs across the world
- Database to be used for joint research
- Added value: participation in definition of research objectives, and analysis of database, of all consortium screening members, while training consortium participants on how to better refine their data and programmes



Multiple levels of data sharing

- Three levels, non-mutually exclusive, of data sharing:
 1. Descriptive information on screening organization and protocols, and summary data on screening activities.
 2. Aggregated data from numbers of events in the screening population and estimates of rates, indicators and outcomes of the events.
 3. Individual data on the screening events of screening history in the screening population.



Characteristics

- Open to all types of screening programs, including opportunistic, as long as they are able to provide the necessary data on screening
- Rules around data provision, sharing and analysis to be defined in the bylaws of the consortium beforehand, taking into account the different regulatory systems.
- We realize that the Global Data Protection Regulation and similar privacy regulations may hamper the ability to share individual-level data.



Federated data system as solution

- In federated data system, individual-level data remain at original source but are transformed into a common format to facilitate distributed analysis and aggregation of results
- Successful examples:
 - Virtual Data Warehouse of the Health Care System Research Network
 - OHDSI: Observational Medical Outcomes Partnership of Observational Health Data Sciences and Informatics ¹

¹ <https://ohdsi.github.io/TheBookOfOhdsi/CommonDataModel.html>



Existing initiatives to learn from

- PROSPR consortium, aimed to promote multisite research on cancer screening while sharing data collected and organized at multiple levels
- Italian data warehouse aimed at collecting individual data about assessment and treatment procedures performed for women referred for assessment within population-based breast cancer screening programs¹

¹ <http://www.qtwweb.it/dwhdoc/>



Next steps: Apply for COST Action grant

Establish International multidisciplinary Consortium of CRC screening programs aiming to implement a common accessible database

- Harmonising the data from the different programs
- Defining a computational approach to extract the relevant indicators accounting for differences between programs
- Addressing ethical and legal aspects related to data sharing in the context of international initiatives.
- Maintaining a sustainable collaborative network that ensures optimal exchange of knowledge to keep CRC screening up-to-date



More information?

COMMENTARIES

Comparing Colorectal Cancer Screening Outcomes in the International Cancer Screening Network: A Consortium Proposal

Randomized trials have shown that stool testing for occult blood and flexible sigmoidoscopy reduce colorectal cancer (CRC) incidence and mortality, and based on observational evidence of its effectiveness, colonoscopy is also frequently



the screening histories of the eligible populations.²

Appropriate and valid comparisons across cancer screening programs are essential for policy and decision makers to evaluate and improve them. A requisite for comparisons of different indicators across settings is the availability of individual-level data on screening episodes and outcomes in the population. Although data on the screening process and outcomes are routinely collected at each screening episode, these data are not always linked and used for evaluation, monitoring, and research purposes. As a result, organized and opportunistic programs are not able to provide estimates of process indicators and outcomes.

3. screening test performance,
4. test result,
5. diagnostic assessment of those with positive test results,
6. treatment of benign precursor lesions or screen-detected cancers,
7. follow-up.

The event history is exemplified for 10 hypothetical eligible persons in Figure 2. All individuals with a negative screening test result stop their screening process at testing and restart screening at the next planned round. Classification of each event is reported using: (1) standardized classification of diseases and causes of death; (2) clinical pathology and laboratory classifi-

Segnan et al.
Gastro 2022



Interested to participate?

Contact Doug Puricelli Perin for more information and to express your interest: douglas.puricelliperin@nih.gov

Thank you

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