Three Rapid Scoping Reviews to map available Biomarkers for Personalised Prevention in Cancer, Cardiovascular and Neurodegenerative diseases

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Introduction and Objectives

The purpose of the **PROPHET** project -"Prevention and Personalised Prevention Roadmap for Future Health Care"- is to provide a Strategic Research and Innovation Agenda (**SRIA**) for Personalised Prevention to the European Union.

Biomarkers are one of the promising tools to improve personalised prevention through risk stratification and design of personalised preventive strategies.

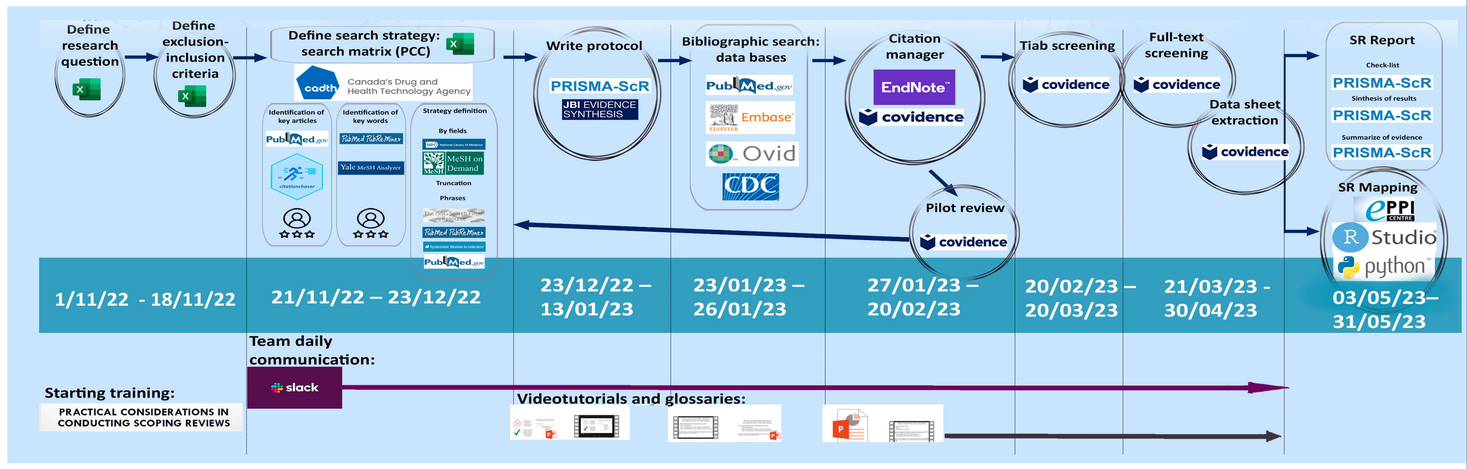
The aim of these three rapid scoping reviews is to provide an overview of the research and potential gaps on *biomarkers* on **cancer, CVD** and **neurodegenerative diseases** for *primary and secondary personalised prevention* in *public health and clinical settings.*

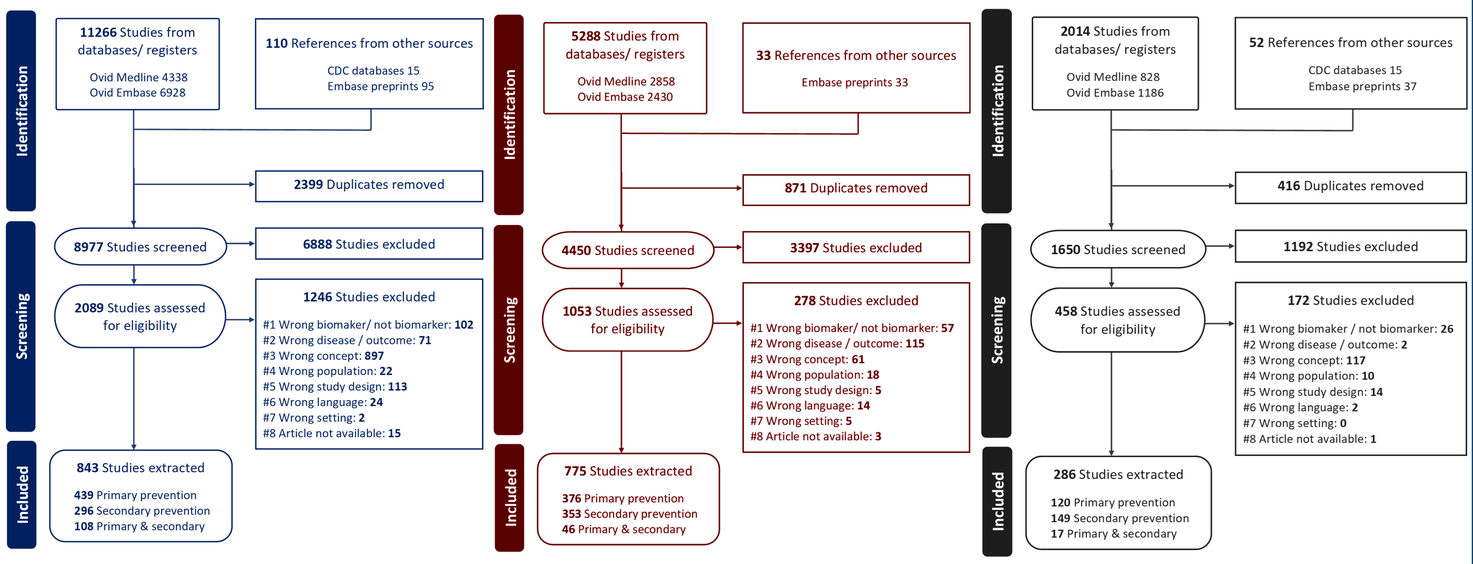
Results

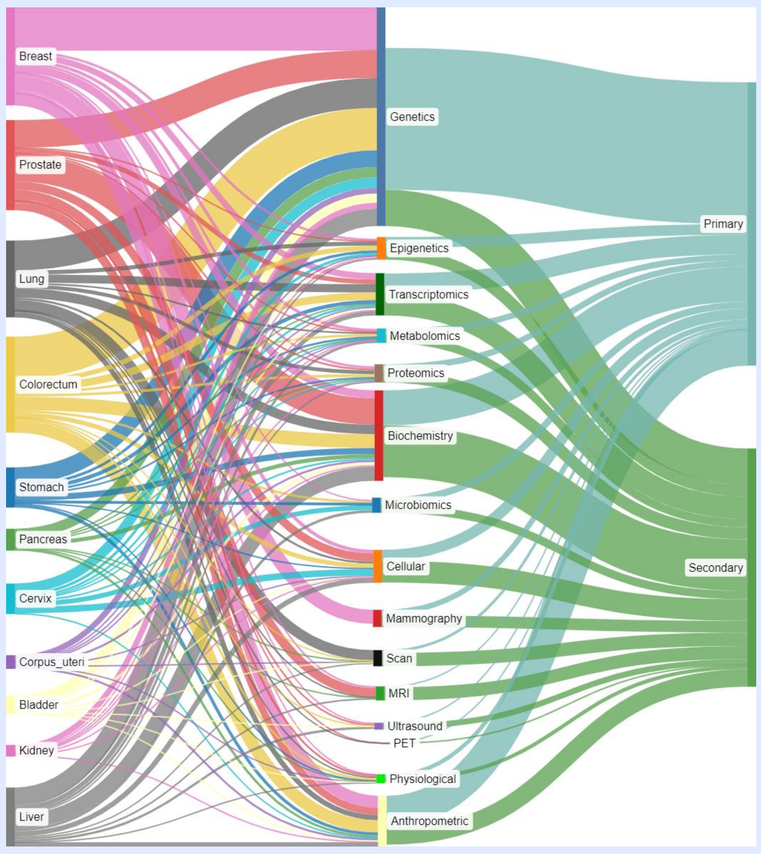
Extensive research in **cancer** and **CVD,** while **limited** studies in **neurodegenerative diseases**. Molecular and imaging biomarkers were the most frequent.

Methods

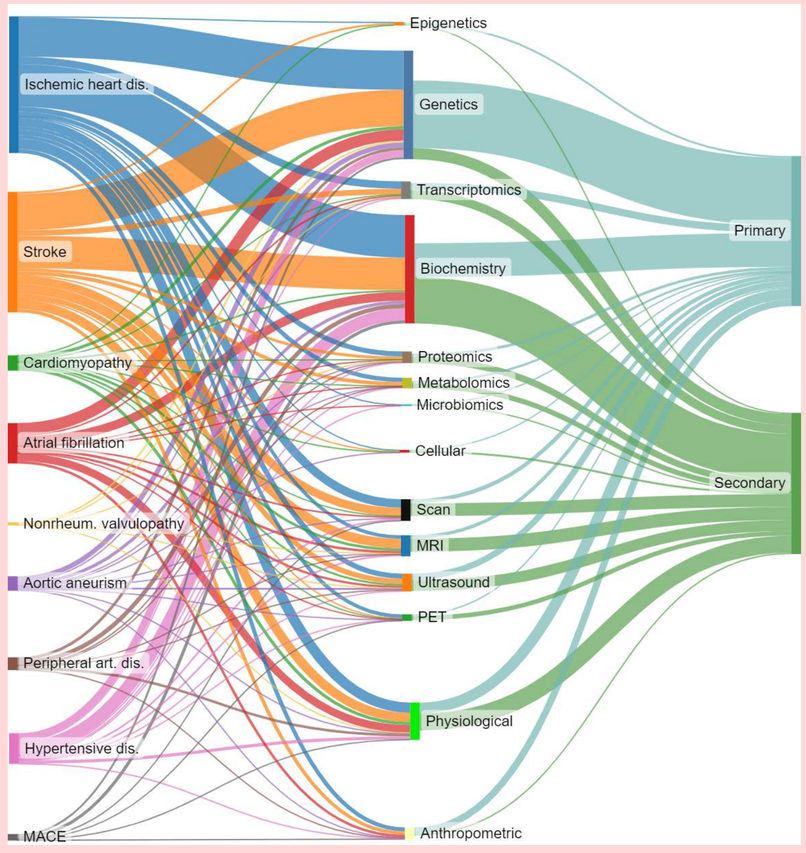
The procotol is available in *https://osf.io/wg62b/*



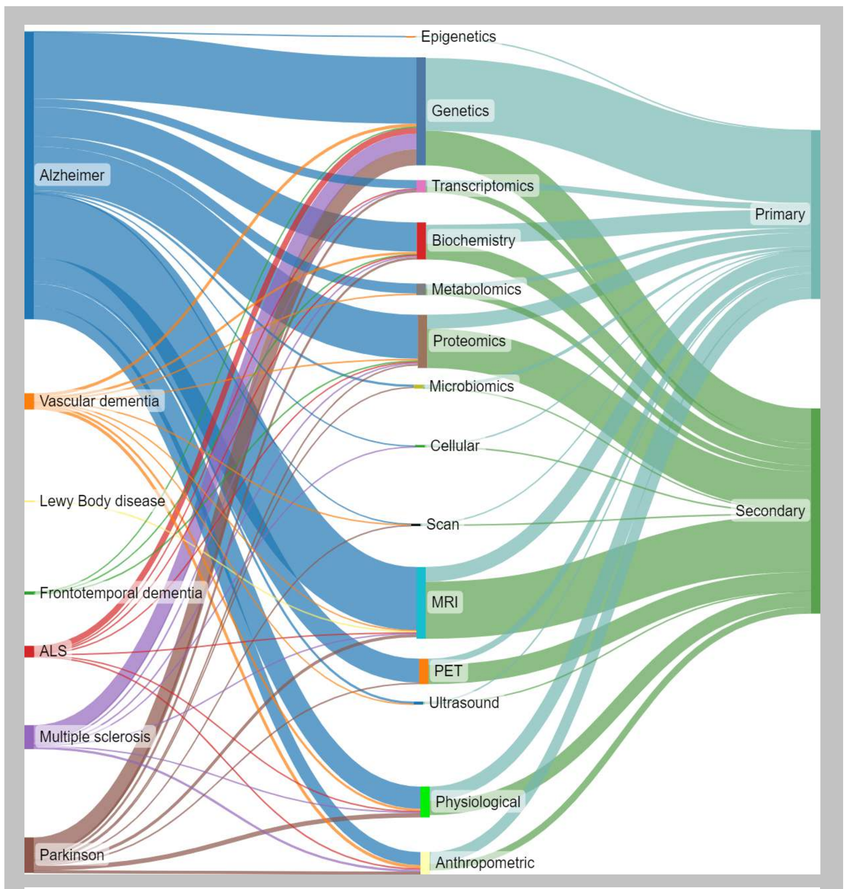




Most research on **breast, lung, colorectal** and **prostate cancers. Multi-omics** (epigenomics, transcriptomics, metabolomics...) remained **limited.**



Most research focused on **IHD** and **stroke**. **Biochemical** and **physiological biomarkers** were relatively more extensive than in the other group of diseases.



Research was highly concentrated on **Alzheimer´s disease**. Important use of **radiomics** among imaging techniques for early detection.

MACE: major adverse cardiac events. ALS: amyotrophic lateral sclerosis. MRI: magnetic resonance imaging. PET: positron emission tomography.

Interactive gap maps

https://biodama.isciii.es/prophet/

Conclusions

- Personalised prevention needs to take into account and **improve what we already know.**
- **Genetics and genomics** are at the forefront of current scientific research, although there is a lack of emphasis on studying **gene-environment interactions.**
- **Heterogeneity** of **cancer types** implies each one needs its tailored approach for prevention.
- Future: combination of biomarkers/personal data in models, **risk scores** and **panels (i.e. CVD)**.
- **Biomarkers** can help to further **subclassify within known high-risk populations** (I.e. family history, APOE genotype, mild cognitive impairment) in **neurodegenerative diseases**.
- Low use of wearables and increasing use of artificial intelligence.

PROPHET
a PeRsOnalized Prevention roadmap for the future HEalThcare
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