THE UNIVERSITY OF BRITISH COLUMBIA
Academy of Translational Medicine
Faculty of Medicine

Regulatory Science Lab
Hope, accelerated

flatiron

Real-World Life-Cycle Evaluation for Precision Medicine: From Conceptualization to Implementation

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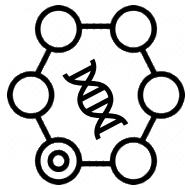
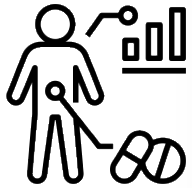
ISPOR Breakout Session – May 14, 2025 – Montreal, QC

Precision medicine evidence challenges traditional regulatory and reimbursement pathways



Small benefitting populations

Small patient groups, rare disease, evaluation is agnostic to traditional categorization



Non-traditional trial design

Master protocols, complex pathways, non-randomized comparator group

Short-term outcomes

Accelerated approval

Limited follow-up and patient numbers

RWE relies on purposefully generated real-world data from healthcare systems, which includes any data collected outside of the confines of trials or experiments

Data fusion is the integration of multiple data sources, collected under heterogeneous conditions, with the aim of estimating causal effects in a target environment

Bareinboim & Pearl, 2016

Study design components found in frameworks for the use of real-world evidence in regulatory approval and health technology assessment.

FDA (2024) Real-World Evidence: Considerations Regarding Non-Interventional Studies for Drug and Biological Products [Draft Guidance]	**CDA-AMC, Health Canada and INESSS (2023) Guidance for Reporting Real-World Evidence**	**NICE (2022) NICE Real-World Evidence Framework**	**EMA (2024) Reflection Paper on Use of Real-World Data in Non-Interventional Studies to Generate Real-World Evidence**
Non-interventional Study Design Components	*Study Design Reporting Recommendations*	*Non-randomized Study Design Components*	*Causal Study Design Components*
Research question	Aim and study question	Aim	Aim
Rationale for RWE Approach	Overall study design	Eligibility criteria	Eligibility criteria
Proposed approach to support causal inference	Rationale of study design	Treatment strategies	Treatment strategies
Ethical considerations	Literature review	Assignment procedures	Assignment procedures, with attention to the prevention of:
Overall study design	Key elements of study design (with diagrams)	Follow-up period	Selection bias
Causal diagram	A priori protocol	Outcome	Information bias
Source population	Describe study members	Causal effect of interest	Time-related bias
Eligibility criteria	Describe study governance	Analysis plan	Confounding
Definitions for key variables	Ethics approval		Follow-up period
Relevant covariates	Funding disclosures		Outcome
Strategies to address potential bias			Causal effect of interest
Index date (time zero)			Follows estimand framework in ICH E9 (R1) guidance
Follow-up period			Analysis plan
Data Sources			
Analytic approach			

FDA: United States Food and Drug Administration; CDA-AMC: Canada's Drug Agency; INESSS: Institut national d'excellence en santé et en services sociaux; NICE: National Institute for Health and Care Excellence; EMA: European Medicines Agency; ICH: International Council for Harmonisation of Technical Requirements of Pharmaceuticals for Human Use.

Learning healthcare

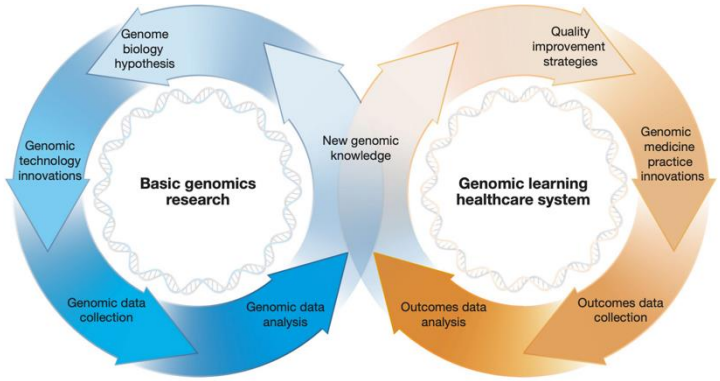


Fig. Virtuous Cycle via Green et al. (2020) Strategic vision for improving human health at the forefront of genomics. *Nature.*

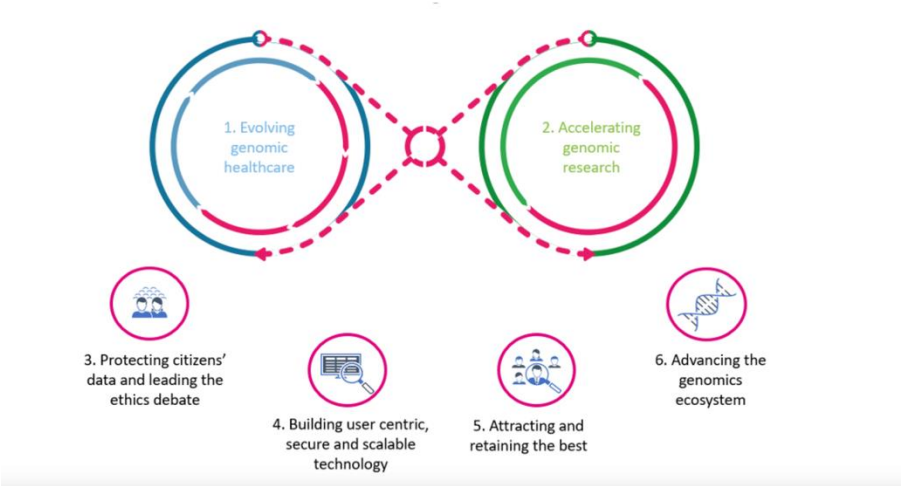
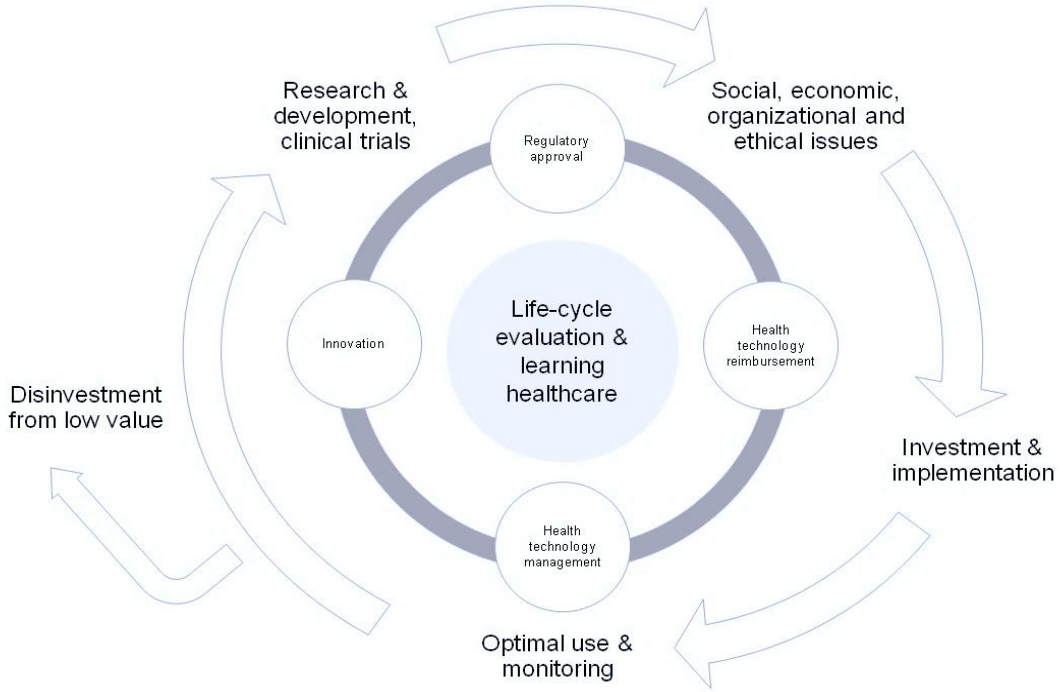


Fig. Infinity Loop via Genomics England. Our Strategy. Accessed 2022 https://genomicschiefscientist.co.uk/index.php/our-strategy/

Stages of the technology life-cycle and learning healthcare



Learning Health Care: Generate and apply evidence to improve patient health in real time; drive discovery as an outgrowth of patient care; and ensure innovation, quality, safety, and value in healthcare.

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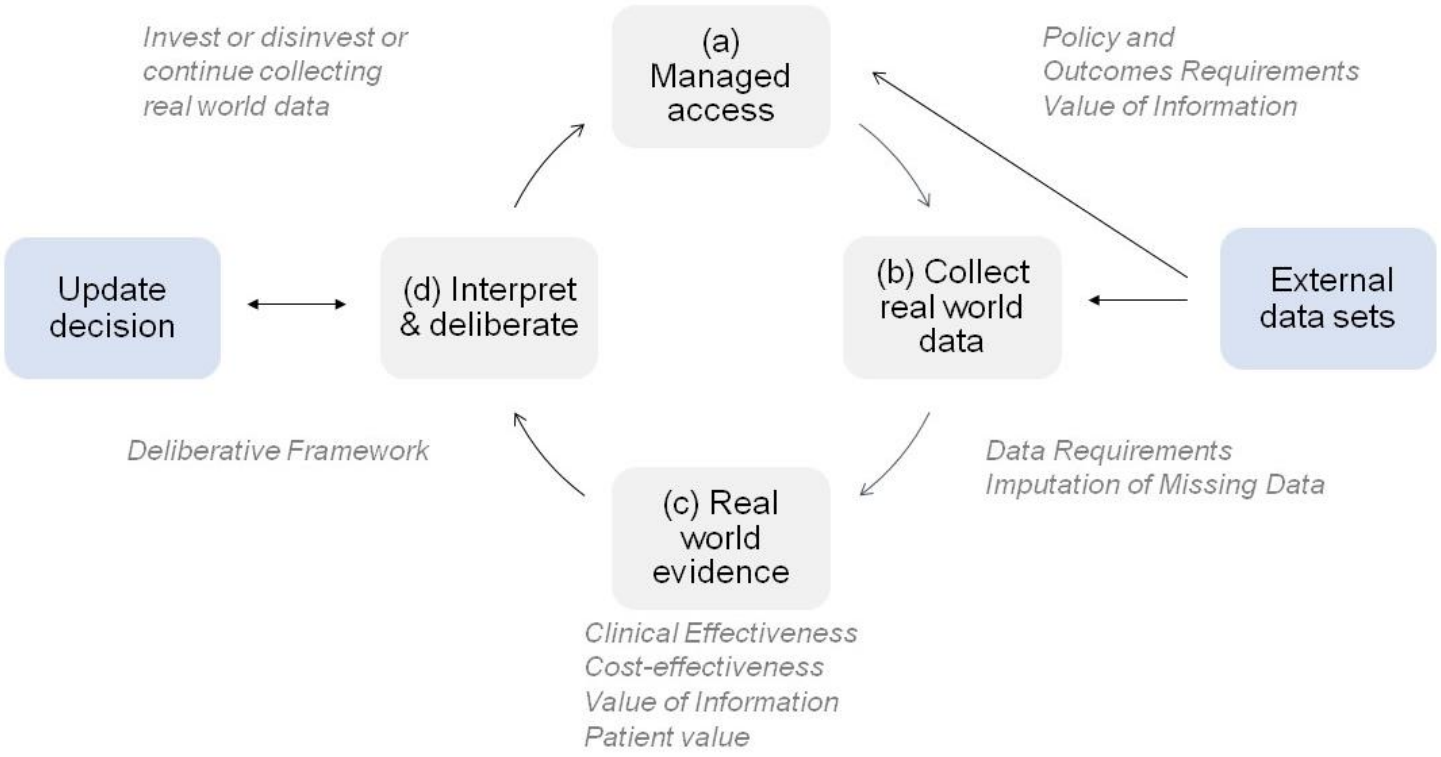
Learning healthcare and RWE

Maladapted health system, regulatory, and reimbursement platforms, policy, and practices prevent developing nimble, responsive systems that enable decisions based on discovery and new forms of evidence

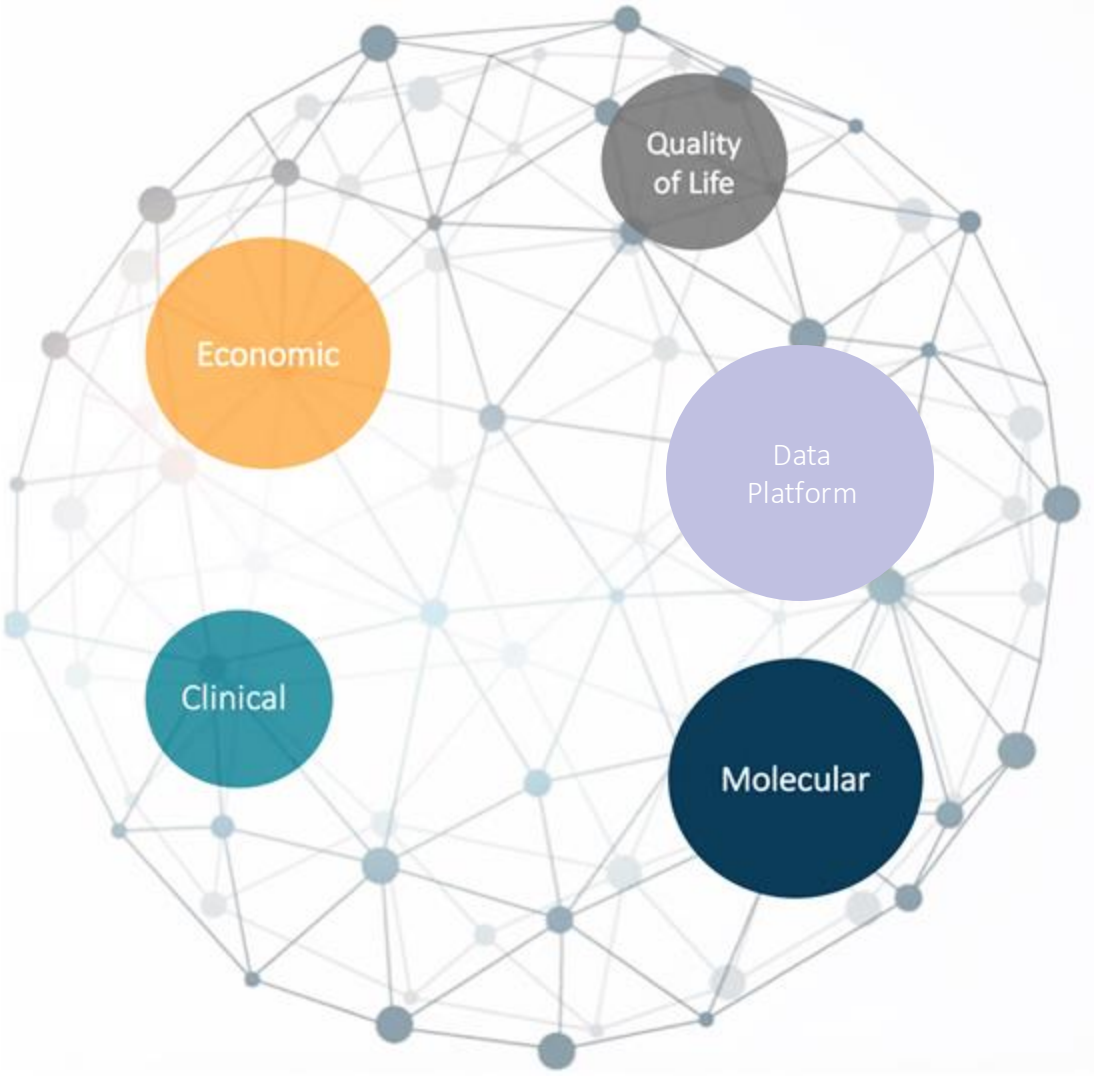
Life cycle assessment is learning healthcare. It standardizes real-world study design, data, and analysis to guide appraisal, re-appraisal, and de-adoption



Regier DA, Pollard S, et al. A perspective on life-cycle health technology assessment and real-world evidence for precision oncology in Canada. *NPJ Precision Oncology* 2022; 76:.
Krebs E, Bubela T, McPahil M, McCabe C, Regier DA. Putting the substance in substantial evidence: and evidence-based approach to flexible drug regulation. *Frontiers in Medicine – Regulatory Science* 2025.

Public Private Partnership

Multi-stream integrated platform for lifecycle health technology assessment, generating decision-grade RWE



Roche

BC CANCER
Provincial Health Services Authority

Breakout session

- RWE and data fusion for causal inference

  Deirdre Weymann, Regulatory Science Lab, BC Cancer and SFU

- RWE transportability in oncology

  Blythe Adamson, Flatiron Health

- Life cycle economic evaluation

  Emanuel Krebs, Regulatory Science Lab, BC Cancer and UBC