BIOMARKER DATA REPOSITORY (BmDR) Patient Focused Frequently Asked Questions (FAQs)

Q: What is BmDR?

A: The Biomarker Data Repository (BmDR) is a public place where new safety biomarker data is collected and stored. These data come from different academic institutions and companies.
The BmDR gives patients a large, trustworthy set of information on these new safety biomarkers, which come from both nonclinical (lab) and clinical (human) studies.
This data is de-identified from different sources and is stored in a secure place. This information is shared with researchers, FDA staff, and others to help them create documents for global regulatory agencies. The goal is to qualify new safety biomarkers for specific uses, update existing uses, and find new biomarkers to help develop future medicines.

Video Resources:

- https://www.youtube.com/watch?v=D4QMNnPeujI
- https://www.youtube.com/watch?v=wWpssu3H8Nc

Q: Why was BmDR created?

A: The BmDR started as a test project in 2019 at C-Path with support from the US FDA. It was fully launched in 2023 to address the need to expand the understanding and advantage of emerging drug induced kidney injury (DIKI) biomarker performance. This included ensuring collection of data sets with equal representation across demographics and social determinants of health (age, gender, ethnicity, religion, income, education, and more) in the US and globally, and across the spectrum of kidney diseases.

Q: What is a biomarker?

A: Biomarkers are biological indicators that provide essential insights into our kidney function, thereby enabling early intervention and personalized care. The timely use of kidney biomarkers, such as serum creatinine, cystatin C, blood urea nitrogen, and urinary albumin, which are a regular part of our lab work, can significantly improve patient outcomes, reducing the likelihood of serious complications like kidney failure, and providing people living with kidney diseases with a better quality of life. Biomarkers can be used to assess a drug's safety in preclinical and clinical trials and monitor for injury while a person is taking a treatment.

Video Resource: What Are Biomarkers And Why Are They Important? Here is a video that breaks down what a biomarker is and the importance of biomarkers: What Are Biomarkers And Why Are They Important?

Q: How does the BmDR operate?

A: The BmDR works by collecting and including deidentified data (data from which all personally identifiable information has been removed to protect individual identities and privacy) on emerging safety biomarkers studies (clinical and nonclinical). The initial focus of BmDR is on kidney injury biomarkers.

Research groups and pharmaceutical companies can contribute their data into the BmDR through a secure process, where it is then stored on the Data and Analytics Platform (DAP). Qualified researchers can then request access to the data. Once approved, they may examine the data for new applications in clinical practice and drug development to pursue regulatory qualifications of the biomarkers. When biomarkers are qualified, they have set ranges of values and determined contexts of use that may be used during clinical trials for drugs, and throughout the entire drug development process to monitor safety and effectiveness.

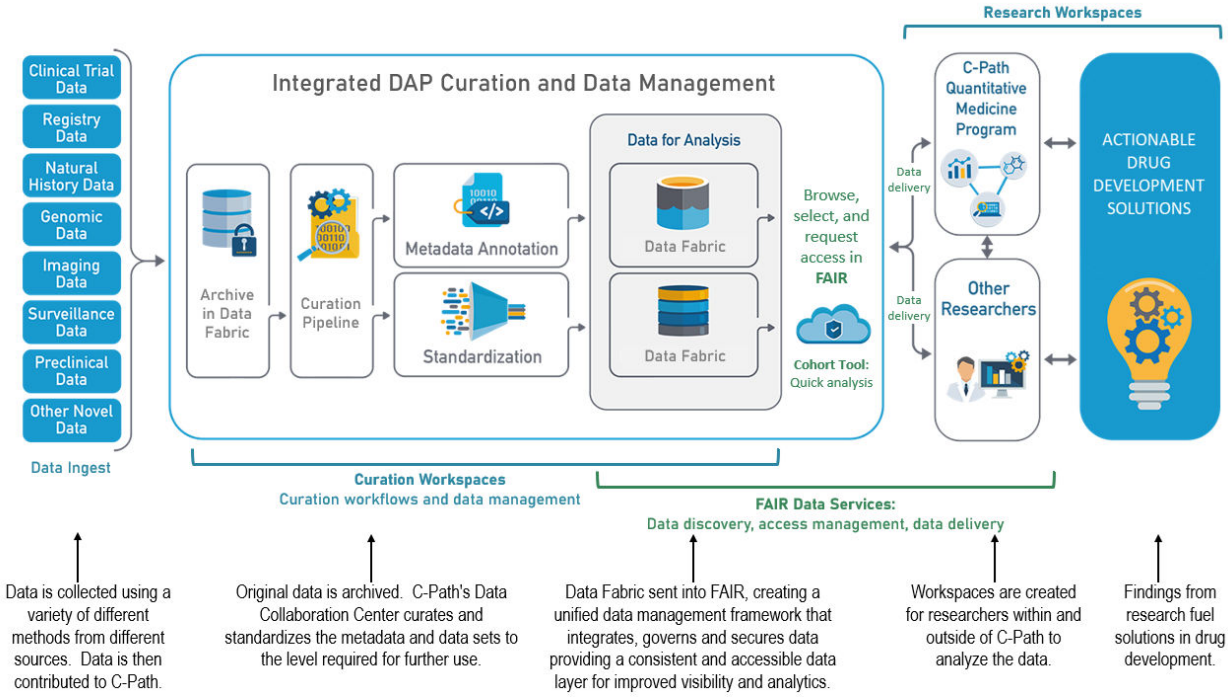
Q: What are the goals of this Data Repository?

A: The goals of the BmDR include:

- Continual gathering and housing standard and emerging biomarker data from academic researchers, as well as pharmaceutical clinical development and research
- Provide opportunities for qualified researchers to understand the performance of the biomarkers across ages and types of kidney diseases
- Maintain data standards and quality of all data in the BmDR Data Analytics Platform (DAP), in accordance with data standards (Clinical Data Interchange Standards Consortium (CDISC), Study Data Tabulation Model (SDTM), and Fast Healthcare Interoperability Resources (FHIR))
- Facilitate qualified researchers' access to high quality deidentified patient-level data
- Provide modeling expertise and stay up to date on Artificial Intelligence/Machine Learning capabilities and relevant publications (BmDR-based and peer-reviewed journals-based). This will help contextualize and potentially expand the utility of validated tissue and body fluid biomarkers, digital histologic imaging, digital radiographic imaging, as well as incorporate non-validated novel biomarkers.
- Facilitate knowledge transfer and expansion through robust analyses to expand regulatory acceptance of multifunctional safety and efficacy assessments beyond current capabilities.

Q: What does the Data and Analytics Platform (DAP) process look like?

A:



Q: Why should patients participate in BmDR efforts?

A: A biomarker data repository is important for patients because it enhances the understanding of disease trajectories and clinical outcomes. It allows researchers and clinicians to add biomarker information to real-world datasets, such as disease or drug registries, and helps qualify biomarkers for drug development.

Biomarkers can detect pathologies (or disease onset) present early in disease potentially paving the way for preventative intervention strategies, which may help patients to avoid disability, poor treatment outcome, disease sequelae and premature mortality.

Patient involvement is vital for the BmDR to focus on specific issues that patients are experiencing. We want this data, and the corresponding findings, to be relevant to patients so that they can tailor their care and maintain their health using the outputs. BmDR has a Community Engagement Committee that actively engages people with kidney disease, those who support them, and researchers to include their input on how they are impacted by kidney disease and the relevance of BmDR to patients. This committee also ensures the diversity, equity and inclusion of datasets obtained by BmDR. If interested in joining the BmDR Community Engagement Committee, workshops, or in focus groups tailored to your area of expertise, please contact bmdr@c-path.org.

Q: Who is responsible for the data being collected through the Repository?

A: C-Path is responsible for the data being collected through the Biomarker Data Repository. C-Path will provide written notices, forms, and other information about your participation in the repository. C-Path has agreements with each data contributor, which they maintain compliance with.

Q: Who has access to BmDR data?

A: Qualified researchers can request access to BmDR data that are permitted to be shared through a Data Contribution Agreement (DCA). Requesters include their organizational information and research purpose with the request, and these researchers may include:

- Academic researchers
- Major Pharma researchers
- Non-major Pharma or Biotech Companies researchers
- Other researchers

If interested in accessing BmDR data, please contact bmdr@c-path.org.

Q: How will research results and study findings be shared?

A: Research results and study findings will be disseminated to Patients through the BmDR quarterly newsletter.

Q: Who can contribute to the data repository?

A: Masked, de-identified data from academic, government scientists, non-governmental agencies, pharmaceutical or biotech companies with clinical or nonclinical studies may be contributed to the BmDR.

Q: How is this data being used?

A: The BmDR data will be used for:

- Supporting submissions to regulatory agencies for novel or expanded qualifications of biomarkers, or for Phase 1, Phase 2, and Phase 3 clinical trials designs.
- Peer-reviewed journal submissions for publication.
    - Qualified researchers are required to produce publication-grade manuscript(s) of analyses performed.
- Periodic interrogation of BmDR emerging biomarkers across the full age and full disease spectra.
- New applications in clinical practice and drug development

Q: How can I request data from the BmDR?

A: First, you will need to create a workspace account here. Once you identify a dataset that you would like to access, you will need to request it following these instructions.

Data

Q: Why is data sharing important?

A: Data sharing is the process of making data resources available to multiple applications, users, or organizations. It involves a combination of technologies, practices, legal frameworks, and cultural elements that facilitate secure data access without compromising data integrity, which involves safeguarding an organization's data against loss, leaks and corrupting influences.

Video Resource: **https://www.youtube.com/watch?v=b6Y_K-olLfc**

Q: What type of data are we looking for?

A: Deidentified data on emerging translational safety biomarker studies (clinical and nonclinical) with an initial focus on kidney injury biomarkers, including Albumin, Clsuterin, Cystatic C, KIM-1, total protein, NAG, NGAL, and Osteopontin. Biomarker information from healthy volunteer populations are also of interest.

Q: Where will my data be stored?

A: All data will be stored in the secure C-Path Biomarker Data Repository Data and Analytics Platform (BmDR DAP). This is a FDA-funded initiative that provides a centralized and standardized location of data to support and accelerate qualification of biomarkers as tools for drug developers.

Q: How can I see the information/data collected?

A: To access individual datasets on the C-Path Data and Analytics Platform (DAP), you will need to create an account. Some data sets will be available to request and download, and some will not be requestable or downloadable for analysis, depending on the agreement in place with the data owner. In cases where data is not available for request or download, the BmDR team will share analyses summaries in the quarterly newsletters. All data is de-identified and unable to be traced back to any patient. The BmDR group will perform recurring analyses on the data and publish summary results in quarterly newsletters, as well as other press releases and social media announcements.

Q: How long do researchers have access to the data that they request?

A: Qualified researchers must submit a request for data, including their organizational information and a plan for their research with the data. Upon submitting the request, it goes to a review team at C-Path composed of BmDR members that review the researcher's credentials and research plan. If approved, the requester must agree to the terms in a Data Use Agreement (DUA). Upon execution of the agreement, data will be securely shared with the requester.

This agreement details the terms of data use and can be terminated by any party without cause by providing sixty days' written notice to the other party. Upon termination of the DUA, the recipient

shall promptly return or destroy (at C-Path's sole election) all data sets and copies thereof provided by C-Path.

Q: How will private information be protected?

A: The security of your data is very important. C-Path's Data Collaboration Center (DCC) has a comprehensive data privacy program which encompasses all jurisdictions in which we manage subject data. This data privacy program includes policies around individual patient-level data that meet or exceed human subject research protection requirements and applicable regulatory policy.

Every contribution of clinical data to C-Path is governed by a Data Contribution Agreement (DCA), which specifies the scope of data sharing permitted by the contributor. Data contributors must also certify that they have met all applicable requirements to enable secondary research on contributed data. All data are encrypted in rest and in transit, accessed only for qualified research purposes governed by data use agreements.

In addition to internal controls ensuring data is secure and patient privacy is protected, the Data and Analytics Platform (DAP) that houses the data is built in the Digital Research Environment (DRE) of Aridhia Informatics. The DRE maintains ISO 27001 certification and is HITRUST certified. Additional certifications and security details about the DRE utilized by C-Path can be found on their Security and Compliance page. The data platform meets and exceeds the physical, technical, and administrative security requirements of HIPAA and continues to improve the ability to safeguard data and measure the state of compliance.

When data is requested from the BmDR DAP, qualified researchers agree to terms and sign a Data Use Agreement (DUA) before receiving the requested data. The recipient of the data acknowledges the importance of data privacy of individuals to whom the data sets may relate to comply with all applicable national, state/provincial, and local laws and regulations regarding patient/research subject privacy, the collection, storage, processing, disclosure and use of personally identifiable information, and other uses and disclosures of the types of data contained in the datasets. The DUA includes additional details and terms to ensure data is protected.

Q: What does the DCC do with the data?

A: The Data Collaboration Center (DCC) was founded by C-Path to generate secure, large-scale data solutions for medical research, and provide ability in curating, standardizing, analyzing, and sharing medical data from around the world. The DCC operates in a neutral space with a focus on accelerating clinical research and improved treatments by maximizing the utility of medical data. This is accomplished through robust data management and curation processes, development and application of data standards and ontologies, and custom-built tools. The DCC possesses top-tier technical expertise and project management resources to support advanced research efforts.

Video Resources:

- https://www.youtube.com/watch?v=EsxJOi2hJm0
- https://www.youtube.com/watch?v=_f4H9z3mkQg

Q: Will it cost me anything to be involved in the BmDR?

A: Currently, there is no cost to contribute data nor access the data sets on the BmDR Data and Analytics Platform (DAP).

Q: Is data available to international entities?

A: Yes. BmDR is a global repository containing data from all over the world. International entities that have malicious intent will not have access to any data. C-Path will not provide data to or engage with researchers from certain countries that are not in good standing with the United States (i.e. Iran, North Korea).

Critical Path Institute

Q: What is the Critical Path Institute (C-Path)?

A: Critical Path Institute, or C-Path, is a global, independent, nonprofit organization dedicated to the generation of actionable solutions to transform the medical product development process. C-Path brings together regulatory agencies, biopharmaceutical firms, universities, other non-profits, and patient groups from around the world to improve public health. Together, these key players work to develop new tools and processes that can accelerate decision-making and medical product development and approval.

Q: What is a Public-private partnership?

A: A Public-private partnership (PPP), or a consortium, is a collaborative group managed by a convening or coordinating organization involving multiple stakeholder organizations including at least one non-profit or 501(c)(3) organization (e.g., academia, government, or foundation) and at least one for-profit organization (e.g., pharmaceutical, biotechnology, or medical device company). A PPP may involve multiple committees and working groups. (from US FDA definition)

Q: What is C-Path's mission?

A: C-Path leads collaborations that accelerate drug development, advancing better treatments for people worldwide.

Q: How does C-Path achieve this mission?

A: C-Path achieves its mission by acting as an independent, neutral third party to form and lead public-private partnerships of regulatory agencies, biopharmaceutical firms, universities, and patient groups in a pre-competitive collaboration and sharing of scientific data.

Q: How is C-Path funded?

A: C-Path is a public-private partnership funded by government agencies such as the *FDA, grants from foundations such as the Bill & Melinda Gates Foundation, Michael J. Fox Foundation and the Polycystic Kidney Disease Foundation, as well as fees from industry participants.

*Critical Path Institute is supported by the Food and Drug Administration (FDA) of the Department of Health and Human Services (HHS) and is 56% funded by the FDA/HHS, totaling $23,740,424, and 44% funded by non-government source(s), totaling $18,881,611. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement by, FDA/HHS or the U.S. Government.

Q: How can I learn more about C-Path?

A: Find out more information about C-Path at our newly updated website: Frequently Asked Questions & Answers - Critical Path Institute (c-path.org)

Predictive Safety Testing Consortium (PSTC)

Q: What is the Predicative Safety Testing Consortia (PSTC)?

A: C-Path's Predictive Safety Testing Consortium (PSTC) was founded in 2006 to serve as a pre-competitive collaboration for the independent assessment, advancement, and validation of novel drug safety tests.

PSTC was formed and officially announced by Health and Human Services (HHS) Secretary Michael Leavitt, Food and Drug Administration (FDA) Commissioner Dr. Andrew von Eschenbach, and FDA Deputy Commissioner Dr. Janet Woodcock. Upon its inception, Woodcock described the consortium as "unprecedented" and a "shining example" of the type of work the FDA would like to see conducted.

PSTC's goal is to obtain regulatory acceptance of novel drug safety tests. PSTC brings together pharmaceutical companies to share and validate innovative safety testing methods under advisement of the U.S. FDA, its European counterpart, the EMA (European Medicines Agency), and PMDA (Japanese Pharmaceutical and Medical Devices Agency). Currently, PSTC is focused on developing and obtaining regulatory qualification of improved clinical safety biomarkers for use in drug development.

Video Resource: https://www.youtube.com/watch?v=TkYokL2asO0

Miscellaneous

Q: Where can I learn more?

A: To learn more please visit: C-Path BmDR

Additional Resources:

1. C-Path Website
2. BmDR Website
3. BmDR 1-pager
4. Published BmDR Newsletters
5. BmDR Technical FAQ