

BIGDATA is designed to bring innovative health information technology tools and methods to effectively advance the mission of the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) through using a Tri-Core Integrated Research Process to receive, review, and resource project needs. These cores are: The Administrative Core, the Methods and Health Informatics (MHI) Core and the Dissemination, Implementation, and Community Engagement (DICE) Core. These Cores are designed to harness digital health data from devices such as smartphone apps and wearable activity devices, and use it along with informatics, advanced analytics, real-world data, and effective community engagement strategies to improve outcomes for patients diagnosed with rheumatologic, musculoskeletal, and skin diseases.

Overview

The **Methods and Health Informatics (MHI) Core** provides methodological, analytic, and informatics expertise to support innovative rheumatic and musculoskeletal disease (RMD) research.

The Core partners with investigators to design rigorous studies, transform complex health data into research-ready assets, and apply advanced analytic approaches to generate impactful and reproducible findings.

Through close collaboration with the Administrative and DICE Cores, the MHI Core ensures that projects are methodologically sound, data-driven, and aligned with NIAMS priorities.

Key Services

- Study design and analytic planning for observational, pragmatic, and real-world evidence studies
- Data engineering, harmonization, and preparation of large-scale health data
- Electronic health record (EHR), claims, and registry-based research support
- Advanced analytics, including predictive modeling and machine learning
- Development of reproducible and scalable analytic workflows
- Integration of digital health data from apps, wearables, and other technologies

Analytical Experience

- Observational and pragmatic study designs
- Risk prediction, phenotyping, and causal inference
- Natural language processing (NLP) and unstructured data analysis
- Advanced biostatistics and machine learning methods
- Secure computing environments and scalable analytic infrastructure

Who We Support

- Early-stage and established RMD researchers
- Multidisciplinary teams leveraging large-scale health data
- Researchers whose projects span clinical research, digital health, and population health
- BIGDATA investigators and Pilot & Feasibility awardees

Leadership

- **Tapan Mehta, PhD** – Director, MHI Core
- **John Osborne, PhD** – Associate Director, MHI Core
- **Navneet Baidwan, PhD** – Data Scientist, MHI Core
- **Alfredo Guzman, MSHI, MEng** – Data Informatics, MHI Core
- **Vasil Bachiashvili, PhD** – Data Scientist, MHI Core

