Faculty
Under the chairmanship of Dr. Jay Magaziner, PhD, Ms.Hyg., the EPH consists of 50 primary faculty, and more than 100 secondary, and adjunct faculty—comprising a multidisciplinary environment of epidemiologists, clinicians, health economists, behavioral scientists, and occupational physicians. The faculty pursues interests in biostatistics and bioinformatics, cancer epidemiology, gerontology, health-care service delivery and outcomes research, toxicology, preventive medicine, maternal and child health, women's health, problem gambling, health disparities, population health, infectious diseases, and other subdisciplines.

Funded Research
The Department of Epidemiology and Public Health (EPH) was awarded $47 million in extramural funds in FY21. This translates to $941K per faculty member. In NIH funding, the 2021 Blue Ridge Report ranked EPH #1 among like departments in public schools of medicine and ranked it #5 among like departments in schools of medicine nationwide. Departmental faculty work closely with other units inside and outside the School of Medicine including the Center for Vaccine Development, the Division of Infectious Diseases, the Department of Obstetrics & Gynecology, the Division of Human Genetics, the University of Maryland Cancer Center, and the Departments of Medicine, Neurology, Surgery, and Rehabilitation Medicine. The Baltimore Veterans Administration Medical Center, the Maryland Department of Health & Mental Hygiene, the Baltimore City Health Department, the Maryland Office on Aging, serve as both placements for the EPH residency program and collaborators on EPH research projects.

The Division of Biostatistics and Bioinformatics
Biomedical research is increasingly a team science, requiring the expertise and skills of collaborators from a variety of disciplines and backgrounds. Members of the Division of Biostatistics and Bioinformatics bring to the team a strong foundation in statistics, mathematics, and computational methods, augmented by domain-specific knowledge of the bio-medical sciences as well as familiarity with biomedical concepts and terminology of preclinical and clinical research. The division serves as a resource to the University community by participating as collaborators in preclinical, translational, clinical, and population research, generally contributing biostatistical or methodologic expertise to the projects; teaching biostatistics and epidemiologic methods to medical students, graduate students and researchers on campus; providing short-term statistical consultations; actively participating in the "Statistical Interest Group", a campus-wide group which organizes seminars and consolidates resources of use to statisticians. Faculty interests include longitudinal data analysis, random effects models, clinical trial designs, categorical data analysis with misclassification or incomplete classification, evaluation of biomarkers, proxy reliability and validity, statistical methods in epidemiology, meta-analysis, infectious disease models, mixture models, survival analysis, recurrent count data, and segmented polynomial models. Additionally, faculty provide statistical bioinformatics expertise including artificial intelligence/machine learning, and data mining methods in the analysis of high dimensionality "big data", as well as systems biology, gene regulatory network inference, biomarker discovery, personalized medicine.

The Division of Cancer Epidemiology
The Division of Cancer Epidemiology brings together faculty who conduct population research to identify environmental, lifestyle and genetic determinants of cancer risk and outcomes and to elucidate mechanisms underlying these associations. Faculty conduct research on a wide array of environmental and lifestyle exposures including viruses, pesticides, hormones, diet, and physical activity; inflammatory, metabolic, and endocrine responses; and germline and somatic genetic and epigenetic changes associated with cancer risk. The Division aligns closely with the University of Maryland Marlene and Stewart Greenebaum Comprehensive Cancer Center where all faculty are members of the Population Science Program, which fosters collaborations across the University of Maryland Baltimore as well as with faculty at the University of Maryland College Park. The Division of Cancer Epidemiology has an international presence and partners with investigators in Nigeria to understand the basis for global disparities in cancer risk and outcomes and to identify remedies.
**Division of Gerontology**
The Division of Gerontology is an academic unit involved in research, teaching, and service in the areas of health and related topics relevant to older persons. Based in a unique interdisciplinary academic environment, the division emphasizes applications of epidemiological, gerontological, and biostatistical principles to understanding and managing the health and health care of older adults and maximizing function. The Division of Gerontology comprises a core group of 7 doctoral-level faculty specializing in issues on aging. Staff includes four program coordinators and data analysts, a three-person administrative core, and technical/field staff members. Core research areas in the division include hip fracture recovery, Parkinson's Disease, persons aging with HIV, multiple morbidities, patient-reported outcomes, Alzheimer's Disease and Related Dementias, and cognitive impairment.

**The Division of Genomic Epidemiology and Clinical Outcomes**
The Division of Genomic Epidemiology and Clinical Outcomes. The Division brings together a core group of faculty with expertise in outcomes research as it applies to the health care system. Faculty members have expertise in clinical and health care epidemiology, quality improvement research, technology assessment, clinical decision-making, and healthcare policy and administration. The research interests of the group are diverse and include the study of infectious diseases, antibiotic-resistant organisms, healthcare-associated infections, traumatic brain injury in the geriatric population, vaginal microbiome, genetics, genetic ontology, health informatics, economics, mathematical modeling and statistics.

Division members are actively involved in teaching medical and graduate student courses and in the mentoring of pre-doctoral students and post-doctoral fellows. Division members are currently funded by grants from the Veterans Administration (VA), National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC) and Agency for Healthcare Research and Quality (AHRQ). We provide opportunities for trainees to conduct mentored research and receive advanced training in clinical research skills.

**The Division of Translational Toxicology**
The Division of Translational Toxicology is an academic unit that conducts research on the environmental and human health effects of chemicals, serves as a resource for chemical risk assessment issues, and provides graduate level training through the Graduate Program in Life Sciences. Faculty members have expertise in cellular mechanisms of receptor binding and function of neurotoxic agents, animal models of ageing-associated changes (meno-and andropause and the treatment of symptoms associated with them), animal models of neurodegenerative diseases and their treatments. In addition, faculty have experience with GLP-compliant studies that support development of drugs to treat ailments induced by toxicants.

**The Division of Preventive Medicine**
The Division of Preventive Medicine focuses on prevention of disease and promotion of well-being of children and adults, in Maryland, the United States, and around the world. Faculty members are involved in training physicians in preventive medicine and public health, teaching epidemiology and prevention to MPH, medical and graduate students, and conducting research on risk factors and prevention of acute and chronic diseases and injury at home, in the workplace, and in the community.

**Clinical and Translational Research Informatics Center (CTRIC)**
The Clinical and Translational Research Informatics Center (CTRIC), led by Dr. Kathleen Tracy, offers a variety of services to help researchers gather high quality data and translate findings into meaningful outcomes. CTRIC provides assistance with research design, power and sample size calculations, data collection, data capture and storage, data management, data analysis, and scientific writing. Data can be captured using a variety of methods, including electronic scanning of paper forms, web-based data entry, manual keying of data and extraction of data from existing data sources (e.g., electronic medical records). Data are stored in a secure, relational database repository and appropriate audit trails for all changes are maintained. CTRIC adheres to robust research practices in order to provide maximum protection of the confidentiality, security and backup of data collected.

Dr. Tracy maintains 6 Fujitsu scanners, software licenses for Teleform, SAS, Stata, StatTransfer, SPSS statistical analysis software, Oracle, and a Dell PowerEdge server that is used exclusively to run CTRICs programs and to securely store research data. Dr. Tracy’s staff includes one data capture technician, one
statistical analyst (MS level), one senior database engineer, one database programmer (MS level), one research supervisor (PhD level), one doctoral graduate student, and four Research Specialists.

Offices
The offices of EPH investigators are located on the first, second, and forth floors of the UMB School of Medicine in Howard Hall and on the second, third and ninth floor of the Medical School Teaching Facility (MSTF) building. Office are fully equipped with a PC’s networked to a color, multifunction printers that serve as copiers and scanners.

Laboratory
The EPH has approximately 12,300 square feet of laboratory space on the 9th floor of the MSTF building and 800 sq ft of wet laboratory space in Howard Hall. This space consists of laboratories equipped for research utilizing whole animals, cell culture, and human samples.

Computer
Overview
We manage approximately 30 servers (mostly virtual on ESX 7.X or Microsoft Azure), 1450 workstations, 276 network printers and 1430 users. Our workforce is spread out across multiple campus buildings including options for working from home. Active directory is used for authentication and security. EMC Isilon is used for file storage and Windows 2012 print services for network printing. Office 365/Outlook is used for email, calendar etc. Microsoft Teams and OneDrive for business are also being utilized. All UMB campus policies are followed. The I.T. team consists of 6 total employees.

Security
All physical servers are in a campus data center secured with lock and key and/or electronic systems. Security alarms, environmental controls, and fire suppression are in place. All data centers have conditioned air/power and servers/network equipment are elevated from the floor to help protect against floods. Windows Server 2019 is the current standard. All servers sit behind a campus firewall and other enterprise security solutions. All services open to the Internet are protected with at least 128-bit SSL encryption and are in a DMZ.

All servers and workstations are protected with Microsoft Defender with real-time scanning protection. Virus definition patterns are updated continuously. A system-wide Anti-Spam/Anti-Virus solution is in place at the internet gateway as the first level of protection. E-mail is protected by Microsoft/office 365 to detect and eliminate spam, malware and phishing attempts. It is also used to automatically encrypt sensitive data if detected. Advanced Threat Protection by Microsoft is being tested to further enhance e-mail security. Multi-factor authentication using Duo is used to protect all remote access systems. Servers utilize Rapid7 agents to scan for vulnerabilities and are remediated within 30 days.

“Strong cryptography and security protocols (e.g. TLS, IPSEC, SSH, etc.) are used to safeguard Confidential Information or PII during transmission over open public networks.”

A secured “PHI Zone” network segment which implements enhanced access controls requiring multi-factor authentication and end-to-end encryption is available as needed. Data is also stored on encrypted drives.

The Information Security Office in the School of medicine is dedicated to managing overall security by assessing risk, ensuring compliancy, educating, and reporting.

Mobile Device Management for Local Data Storage
Mobile devices are primarily used to access Outlook/Office 365 apps and are protected by Microsoft Intune using standard security controls. All communication is encrypted.
Patch Management

All Windows computers have Automatic Updates enabled. Every Windows computer is setup and locked down via policy to download and install all critical patches. Microfocus ZENworks 2020 Patch Management is also used for Windows and 3rd party application patch management.

Workstation/Workstation Security

Workstations are custom-built. Windows 10 is the standard for desktop operating systems; however, we also have MacOS. Microsoft Defender is used to protect workstations from viruses/malware. Virus definition patterns are continuously updated and deployed to all workstations. Screen savers are enabled on each windows computer and are set to engage after 15min of inactivity. Users must enter their network password to unlock the screen saver. All these settings are locked down by gpo and cannot be modified by the user. All users have general user security privileges and do not have administrator rights. All Windows devices are encrypted with BitLocker to protect sensitive data at rest. MacOS uses FileVault to protect sensitive data at rest. Workstations utilize Rapid 7 agents to scan for vulnerabilities and are remediated within 30 days. AppLocker is used to restrict unauthorized applications.

Software

Software licenses are the responsibility of the end user and/or division unless provided by IT. The I/S staff also provides limited support for UMMS clinical applications. Microfocus Zenworks Configuration Manager and Jamf Pro is used to distribute and maintain workstation software, hardware inventory, and policy management. SysAid is used to track service requests from the end users.

New Accounts

Authorized users may request new accounts using an online portal secured by their network credentials. Limited auto-provisioning of accounts linked to HR systems is in place.

Password Changes

The I/S staff will change passwords with proper identity verification. Passwords meet and/or exceed UMB’s password policy. Intruder detection is in place to lock out an account to minimize brute-force attempts at cracking passwords. A user portal is in place to allow users to change/reset their own password.

File System Rights Changes

All file system rights changes must be submitted to the user’s respective administrator and/or owner of the directory, who must approve the rights request.

Backups

Full backups are run on all servers weekly and an incremental is performed the rest of the week. Veeam is used to backup all servers to disk and tape. Monthly tapes are sent off-site to First Federal in the event of a major disaster and never over-written. Each backup job runs a verification process to ensure real data has been backed up. The last few days of data on departmental servers are copied to tape for airgap protection against Ransomware.

Disaster Recovery

All on prem servers and their data are replicated to a secondary datacenter blocks away from the primary site. In the event of server/san failure, we can failover to our secondary datacenter with a maximum data loss of 1 hour to 1 day depending on the system.

Media Disposal

Media is disposed of and destroyed using UMB’s Hitech contract.

Remote Access

Cisco VPN and Azure Virtual Desktop are offered to authorized users for remote access beyond what is offered by office 365.
Office 365 Security@SOM

- Access is protected with Multi-factor authentication using DUO.
- Mobile devices accessing local data are managed by Intune to meet minimum security requirements.
- Advanced Threat Protection is in place to mitigate malicious links and attachments before they are delivered to a user’s inbox.
- Email can be encrypted on-demand by users or is automatically encrypted when sensitive data has been detected outbound. Auto-forwarding rules are in place to prevent data from automatically flowing out of the university.
- Data Loss Prevention policies monitor our environment for sensitive data and prevents users from sending that information outside our organization.
- Security Awareness Training by Knowbe4 is used to educate and evaluate our user base. We also utilize their “Phish Alert” Button in Outlook to enable users to easily report suspicious e-mails.
- UMB has a Business Associates Agreement with Microsoft to secure our data.
- https://servicetrust.microsoft.com/ViewPage/TrustDocumentsV3 - This is a link to all of Microsoft’s security compliance documents. All audit results, testing results, FAQ’s etc. can be found at this link.