**Area of Emphasis in Health Outcomes and Informatics**

**Overview**  
The health outcomes field complements the traditional clinical field and guides different healthcare stakeholders regarding patient access and relative value of specific pharmaceutical drugs and clinical services. The field was once considered a mere support function but is gaining more traction globally as the healthcare system moves to a more value-based care structure. The health outcomes field encompasses varied aspects such as real-world data, machine learning and mathematical modeling, epidemiological designs, patient quality of life reports, opportunity cost of various treatments and services, budget impact, and cost-effectiveness models.

As the need for health outcomes field has grown, so has the number of educational opportunities for students in pharmacy schools and other healthcare professions. The Health Outcomes and Informatics program is designed to introduce students to concepts and issues as they relate to a variety of practice settings, including managed care, pharmaceutical industry, hospital, clinical research organization, and specialty pharmacy. Students will be able to complete the requirements for the area of emphasis in Health Outcomes and Informatics while earning their Doctor of Pharmacy degree without having to take additional credit hours. Once completed, the area of emphasis will appear on students’ WVU transcripts.

**Program Goals**

* To understand the importance of clinical, economic, and patient-reported outcomes related to   
   pharmaceuticals and clinical services in healthcare.
* To train students in health outcomes and informatics that improves their clinical decision making for patients, providers, payers, pharmaceutical industry, and government.

**Training Focus**

* Recognize the importance of health outcomes in medical decision making.
* Identify key data, trends, and issues in managed care.
* Understand cost, quality, and access issues in pharmaceutical care.
* Discuss the role of artificial intelligence, big data technology, and data science in augmenting patient care processes.
* Design, conduct, and analyze research topics in health outcomes and informatics including study design, methodology, and statistics used in solving pharmaceutical problems.

# Requirements for the Area of Emphasis in Health Outcomes and Informatics

# Required Courses – 5 credit hours

* PHAR 777 – Health Outcomes Research Design (2 credits) (Fall, Synchronous Online)
* PHAR 793D – Managed Care Principles and Policy (1 credit) (Spring, Synchronous Hybrid)
* PHAR 793A – Health Data Science Research (2 credits) (Spring, In-Class)

**2. Required Rotations**  
 Students must choose one rotation from the approved rotations listed below:

* Rational Drug Therapy Program (RDTP)
* Highmark
* Xcenda (Application Only)
* Humana
* WVU Medicine Specialty Pharmacy
* Peak Health

1. **Optional**: **Independent Study (PHAR 749)**This provides an opportunity for students to conduct their own research or contribute to existing health outcomes-related projects. There is a potential to present the work at the annual meetings of the Academy of Managed Care Pharmacy (AMCP) and the International Society for Pharmacoeconomics and Outcomes Research (ISPOR).

# Suggested Plan of Study

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| --- | --- | --- |
|  | **Fall Semester** | **Spring Semester** |
| **P2/3 Years** | PHAR 777 (2 crs) | PHAR 793D (1 crs) and PHAR 793A (2 crs) |
| **P4 Year** | One Rotation | |
| **P2/3 Years** | Optional: Independent Study (PHAR 749) | |
| **Total Credit Hour**  **Requirement** | 5 Credit Hours | |

**Eligibility**

Students must be currently enrolled in the Doctor of Pharmacy program and in good academic standing.

**Application Deadlines**

Students normally apply by March 1 of their P1 or P2 years for admission in the fall semester of their P2 or P3 years. However, students are welcome to apply at any time. Eligible program coursework completed prior to acceptance will be applied to the program requirements.

**Application Procedure**

Students will email April Morris (april.morris2@hsc.wvu.edu) and include the following elements:

1. a letter/email regarding your intent to enter the program
2. a brief description describing the applicant’s future career goals and what you expect to   
    gain through completion of the Area of Emphasis
3. a current Curriculum Vitae

Students can contact Dr. Khalid Kamal (kamalk@hsc.wvu.edu) for any questions related to the program.

**Faculty Profile**

## **Abdullah Al-Mamun (https://directory.hsc.wvu.edu/Profile/69564#biography)**

Dr. Mamun is an Assistant Professor in the Department of Pharmaceutical Systems and Policy (PSP) department and received his PhD in Computing and Information Sciences from the University of Northumbria at Newcastle, UK. Prior to joining WVU, he worked as a Health Outcomes Data Science faculty in the College of Pharmacy at the University of Rhode Island and completed two postdoctoral fellowships in Epidemiology of Microbial Diseases in the Department of Population Medicine & Diagnostic Sciences at Cornell University and in the Yale School of Public Health at Yale University. Dr. Mamun is a health data scientist specializing in the areas of health outcomes, data science and epidemiology. He brings interdisciplinary research experiences in building mathematical modeling and health data science tools (predictive models, machine learning) to understand disease dynamics at both individual and population level.

**Sabina Nduaguba (https://directory.hsc.wvu.edu/Profile/71926#biography)**Dr. Nduaguba is an Assistant Professor in the PSP department and received her master’s and doctoral degrees in Pharmaceutical Sciences (Health Outcomes) at the University of Texas at Austin. Prior to joining WVU, she completed a postdoctoral fellowship at University of Florida on the application of advanced epidemiologic methods in research design and real-world evidence generation. Dr. Nduaguba’s research focuses on cancer prevention and control through smoking cessation, health disparities among people with cancer related to healthcare access along the cancer care continuum and the application of genetically-informed pharmacological treatment to improve health outcomes. Dr. Nduaguba holds a joint faculty position with WVU Cancer Institute.

**Khalid Kamal (https://directory.hsc.wvu.edu/Profile/65520#biography)**

Dr. Kamal is a Professor and Chair of the PSP department and received his PhD in Health Outcomes Research from the WVU SOP. Dr. Kamal's primary research and teaching interests have been pharmacoeconomics, patient- reported outcomes research, research methods, and improving quality of care using real-world data sources such as electronic medical records and specialty pharmacy data. Over the years, his research has focused on issues such as cost-effectiveness of treatments, quality of life, productivity costs, economic burden of diseases, and issues related to quality of care in chronic and rare conditions.