



## The Population Health Management Fellowship: A Competency-Based Training Program Aligned with National Health Transformation Priorities

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### Abstract

Population Health Management (PHM) represents a strategic shift toward proactive, data-driven, and value-based approaches to improve health outcomes for defined populations (1,2). This article describes a one-year fellowship curriculum developed under the auspices of the Saudi Commission for Health Specialties (SCFHS). The program targets board-certified physicians in Preventive Medicine or Family Medicine, emphasizing integration of clinical care, public health, analytics, and health system leadership. Structured around the CanMEDS 2023 framework (3), the curriculum addresses national priorities such as non-communicable disease (NCD) burden reduction, health equity, and alignment with Vision 2030 and related transformation initiatives (4,5). Key components include mandatory rotations, a longitudinal capstone project, diverse teaching methods, and rigorous formative and summative assessments. This fellowship offers a practice-oriented pathway distinct from academic degrees, equipping graduates to lead population-level interventions in healthcare settings.

Keywords: Population Health Management, fellowship training, competency-based education, CanMEDS, non-communicable diseases, value-based healthcare, health system transformation

### Introduction

Population Health Management (PHM) is an integrated, proactive approach that leverages data analytics to identify population needs, stratify risk, design targeted interventions, and evaluate outcomes across the care continuum (1,6). Unlike traditional episodic care, PHM adopts a whole-population perspective, bridging clinical medicine, public health, and policy to emphasize prevention, early risk identification, and coordinated management of chronic conditions while optimizing costs and resources (2,7).

In regions facing a dual burden of rising non-communicable diseases (NCDs) and persistent infectious threats, PHM is essential for addressing health inequities, behavioral determinants, and system inefficiencies (8). NCDs, such as diabetes, cardiovascular disease, obesity, and cancer, drive substantial morbidity, premature mortality, and economic costs. In Saudi Arabia, NCDs account for a major proportion of deaths and impose significant economic burdens, with cardiovascular disease contributing substantially to losses estimated in billions of SAR annually (9,10). Effective PHM enables early identification of at-risk groups via predictive



analytics and registries, evidence-based interventions integrating clinical and community strategies, and strengthened governance for measurable outcomes (1,11).

This curriculum outlines a structured fellowship designed to train physician-leaders in PHM. It aligns with national health priorities, including value-based healthcare models and frameworks such as structured population health cycles (12). The program bridges gaps in existing training pathways, offering practical skills in analytics, system redesign, and leadership (13).

### **Distinctive Role and Value of the PHM Fellowship**

The fellowship differs from academic pathways (e.g., Master's or PhD in public health), which prioritize theoretical research and scientific inquiry. In contrast, this program is practice-oriented, embedded in real-world health systems, and focused on leadership in population analytics, intervention design, and transformation (14).

Compared to related clinical programs, such as Preventive Medicine (strong in epidemiology but limited in digital analytics and system integration) or Family Medicine (excellent in patient-centered care but lacking population-level stratification and policy application), the PHM fellowship fills critical gaps (15). It provides an accelerated leadership track for clinicians to influence programs, policy, and performance, enhancing employability in national health initiatives while contributing to equity, social determinants of health (SDOH), and universal coverage goals (4,5).

### **Program Entry Requirements**

Eligibility is restricted to physicians holding Saudi Specialty Certificates (or equivalents) in Preventive Medicine or Family Medicine. Additional requirements include at least six months of relevant experience, passing a subspecialty admission examination/interview, sponsorship for full-time training, letters of recommendation, curriculum vitae, personal statement (500–750 words on motivation and alignment with national priorities), and proficiency in English and data tools (e.g., Excel, EHR systems, SPSS, R, or Tableau). Selection prioritizes innovative thinking and commitment to health system improvement via panel interviews with scenario-based questions.

### **Program Structure and Duration**

The fellowship spans one year (F1), comprising mandatory core rotations, a longitudinal capstone project, and annual leave. Rotations are designed to build competencies progressively.

### **Core Rotations**

- Introductory Course (1 month): Academic center and outpatient clinic – introduces PHM frameworks, EHR navigation, and clinical linkages.



- NCD Management (4 months): Outpatient/inpatient settings (diabetes, cardiology, oncology, neurology, primary care) – focuses on registries, segmentation, risk stratification (e.g., Johns Hopkins ACG System) (16), lifestyle counseling, and outcome evaluation for conditions like diabetes, hypertension, cardiovascular disease, and cancer.
- Infectious Disease Prevention & Control (1 month): Public health and infection control units – includes outbreak simulation, contact tracing, surveillance, and vaccination activities.
- Field-Based Services & SDOH (1 month): Regional public health/community programs – addresses SDOH screening, outreach, and vulnerable populations.
- Data Analytics & Quality Management (2 months): QI offices and data centers – emphasizes dashboards, predictive modeling, root cause analysis, PDSA cycles, and Lean/Six Sigma.
- Health Systems & Policy (2 months): Policy and administrative bodies – involves policy brief drafting, pathway evaluation, and emergency preparedness.
- Capstone Project (longitudinal): Design, implement, and evaluate a real-world PHM initiative, culminating in presentation to leadership or at a conference.

## Competency Framework

The program adopts Competency-Based Education grounded in CanMEDS 2023 roles: Medical Expert, Communicator, Collaborator, Leader, Health Advocate, Scholar, and Professional (3). Key Medical Expert outcomes include mastery of the PHM cycle, data-driven decision-making, value-based principles, risk stratification (e.g., Johns Hopkins ACG, Charlson Index), intervention design for priority NCDs, outcome evaluation (Donabedian model, HEDIS/AHRQ metrics) (17), quality improvement, and population engagement via digital tools.

Other roles emphasize effective communication of data, intersectoral collaboration, leadership in initiatives, advocacy for equity and SDOH, evidence appraisal/applied research, and ethical professionalism.

## Teaching and Learning Methods

Grounded in adult learning and competency-based principles, methods include academic half-days (weekly sessions on analytics, SDOH, VBHC, leadership), workshops (e.g., data visualization, intervention design), clinical practice, field experiences, journal clubs, multidisciplinary meetings, mentoring, and digital learning. Fellows present topics, lead activities, and maintain e-portfolios.

## Assessment and Evaluation

Formative tools (Mini-CEX, CBD, DOPS, logbook, ITER, reflective portfolio, capstone reviews) provide continuous feedback. Summative assessment includes a written MCQ exam



(70%), capstone presentation/defense (20%), and professionalism/portfolio review (10%). Eligibility requires rotation completion, satisfactory formatives,  $\geq 75\%$  attendance, and capstone success. A Final In-Training Evaluation Report supports certification of training completion, qualifying for the final specialty examination.

### **Program Evaluation**

Ongoing quality assurance incorporates trainee/faculty surveys, rotation evaluations, accreditation data, and milestone achievement tracking to refine delivery and address deficiencies.

### **Conclusion**

This PHM fellowship equips physicians with essential skills to lead data-informed, equitable, and sustainable population health improvements (18). By integrating clinical expertise with analytics, policy, and leadership, graduates are positioned to advance national goals for healthier populations and efficient systems (4,5). Future iterations will incorporate emerging evidence and stakeholder input to maintain relevance.

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