A Population-Based, Risk-Adjusted Model for Forecasting Psychological Health Provider Workforce Needs

Dan Harris, PhD, Presenter
Linda M. Marr, MS
Health Research and Policy, CNA

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Outline

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Introduction

- Psychological stresses of current operations in Iraq and Afghanistan
- Need to assure adequate workforce to meet psychological healthcare requirements of service members, their families, and other beneficiaries eligible to receive care through Defense Health Plan (DHP)
  - Under new vision of providing this care
- Congress and Department of Defense (DoD) interested in knowing adequacy of current workforce resources
- DoD and Service medical departments need tool to assist workforce planning
- Resulted in creation of PHRAMS
What is PHRAMS?

The **Psychological Health Risk-Adjusted Model for Staffing**

**Major attributes:**
- Population-based
- Risk-adjusted
- Scalable/modifiable

**Produces projections of:**
- Required number and mix of providers (staffing requirements)
- To meet annual needs for psychological health services
- Of all 9.3M Defense Health Plan (DHP) beneficiaries

**Planning and modeling tool**
- User application with modifiable “soft-wired” parameters
- Can be annually updated
  - Refresh data and update trends
What does PHRAMS produce?

- **Annual projected staffing requirements**
  - Projects over a six-year planning horizon
  - Projects staffing requirement by provider type
    - Mental health specialties, primary care, others
    - Projections take into account expected productivity

- **Standard reports**
  - Longitudinal and Year 1
    - Year 1 reports include a “gap analysis”
  - Can use default values for parameters or modify them for modeling purposes
  - Can select level of aggregation
    - Primary planning units or aggregations of units up to system-wide
  - One branch of Service or all branches
Approach to developing PHRAMS

- Reviewed literature and existing staffing models
  - Both military and civilian models
- Conducted key informant interviews
  - Clinical, workforce, and management staff
- Analysis of prevalence and utilization by risk-adjusted populations of DHP beneficiaries
  - Grouped by demographic and military-related attributes
    - Age, gender, residence, type of plan enrolled in, beneficiary category, rank group (SES), Branch of Service,
    - Deployment history/exposure to deployment stress (and trends)
  - Prevalence and utilization trend lines and projections
- Extensive input from working group of end users
PHRAMS overview

- Total staffing requirement =
  - Encounter based + non-encounter based requirements

- Encounter based requirement =
  - Expected encounters / productivity

- Expected encounters =
  - \( \sum_{i,j} ( \text{population}_i * \text{prevalence}_{i,j} * \text{encounter rate}_j ) \)
    - Where \( i \) = risk group and \( j \) = psychological health diagnosis group
  - Encounters allocated to provider type
  - Encounters can be directly provided or purchased

- Non-encounter based requirement =
  - Enrollee-based + structural unit + support staff requirements
  - Allocated to provider type for “direct care” sector only
PHRAMS Flow diagram

1. **Current & Projected Beneficiary Population by Demographic Attributes**
   - Divide BenPop into Risk Groups
   - Assign Projected BenPop to Primary Planning Units
   - Determine Adjusted Prevalence Rates by Risk Group by Dx Group
   - Determine Optimal Encounter Rates for Dx Groups

2. **Allocate Encounters to Provider Type and Care Sector**
   - Calculate Annual Expected Encounters under Optimal Conditions

3. **Productivity by Provider Type and Care Sector**
   - Assign Projected BenPop to Primary Planning Units
   - Determine Optimal Encounter Rates for Dx Groups
   - Determine Adjusted Prevalence Rates by Risk Group by Dx Group

4. **Encounter-Based Staffing Requirement by Provider Type and Care Sector**
   - Productivity by Provider Type and Care Sector
   - Calculate Annual Expected Encounters under Optimal Conditions

5. **Non-Encounter-Based Staffing Requirement by Provider Type for Direct Care**
   - Productivity by Provider Type and Care Sector
   - Calculate Annual Expected Encounters under Optimal Conditions

6. **Total Staffing Requirement**
   - Productivity by Provider Type and Care Sector
   - Calculate Annual Expected Encounters under Optimal Conditions

7. **Total Staffing Requirement**
   - Non-Encounter-Based Staffing Requirement by Provider Type for Direct Care
   - Productivity by Provider Type and Care Sector
   - Calculate Annual Expected Encounters under Optimal Conditions

8. **Provider Inventory by Provider Type**
   - Provider Inventory by Provider Type
   - Calculate Annual Expected Encounters under Optimal Conditions

9. **Output Reports**
   - Projected Number and Mix of Providers by Care Sector Over 6 Years and Year 1 Gap Analysis
   - Provider Inventory by Provider Type
   - Calculate Annual Expected Encounters under Optimal Conditions
PHRAMS user application

CD-based MS Access application with users guide

- Select the required “report parameters”
  - Service
  - Planning unit level
  - Type of report

- Accept or edit (modify) soft parameter default values
  - Prevalence rate adjustment for untreated prevalence
  - Percentage distribution in deployment history groups
  - Provider productivity metrics
    - Annual hours available for providing care
    - Encounters per hour
  - Percentage of encounters apportioned to direct and purchased care
  - Percentage of direct care providers who are civilians
Principal findings

- PHRAMS performed as expected and produced usable and realistic results
- End users were able to use the application for planning
- Sensitivity analysis revealed key drivers of staffing needs
  - Analysis focused on direct care requirements (not purchased care)
  - PHRAMS projected requirements most sensitive to:
    - Population growth projections
    - Treated prevalence projections
    - Provider productivity
    - “Make-or-buy” decisions or policies
      - Provide care directly or purchase it
Conclusions and implications

- Possible to create a usable model to project psychological health workforce requirements using administrative & medical records and input from end users.
- Such models can be used to respond to planning and policy analysis needs.
  - Can be used by such entities as integrated delivery systems, accountable care organizations, managed care organizations, government healthcare workforce policy agencies, and provider specialty societies.
  - Can be used for workforce planning, provider recruitment, identification of gaps in current workforce and workforce shortage areas, workforce policy analysis, make-or-buy (provide-or-purchase) decisions.
Questions
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Contact information

Dan Harris, PhD
Associate Director
Health Research and Policy
CNA
4825 Mark Center Drive
Alexandria, VA 2231
703 824-2283
harrisd@cna.org