Integrating Population Sciences into Cancer Center Research

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Population Sciences in Cancer Center Research

• OVERVIEW OF NATIONAL CANCER INSTITUTE COMPREHENSIVE CANCER CENTERS
• THE NEED FOR POPULATION SCIENCE IN THE RESEARCH FOR CANCER PREVENTION AND CONTROL?
  • CAN WE PREVENT AND CONTROL CANCER (TREATMENT INCLUSIVE) WITH KNOWLEDGE GAINED FROM MOLECULAR-CELL-BASED RESEARCH ALONE?
  • DOES CANCER OCCUR BY CHANCE ALONE OR THERE IS ALWAYS A CAUSE?
  • ARE CANCER RESEARCH CENTERS ISOLATED FROM THE HEALTH CARE SYSTEM?
  • WHAT ARE THE LEADING DRIVERS FOR RESEARCH FUNDING NOW?
National Cancer Institute (NCI)-Designated Cancer Centers

• Institutions dedicated to research in the development of more effective approaches to prevent, diagnose and treat cancer

• 67 centers: most affiliated with university medical centers; some are freestanding centers; some conduct research only

• Entrée to greater federal funding:
  • P30 range $720,000 - $13.6 million in FY11 (1 year)

• Recognition of scientific excellence and outstanding leadership

Source: National Association of Cancer Center Development Officers
National Cancer Institute

Overview (www.cancer.gov)
- Part of the NIH, one of 11 agencies of Department of Health and Human Services
- Established under the National Cancer Institute Act of 1937
- The fed’s principal agency for cancer research and training
- Director: Harold Varmus, MD, Co-recipient of Nobel Prize in 1989 for studies of the genetic basis of cancer

Mission
“…..conducts and supports research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer, rehabilitation from cancer, and the continuing care of cancer patients and the families of cancer patients.”

Source: National Association of Cancer Center Development Officers
Two Levels of NCI-Designated Centers

1. **Comprehensive Cancer Centers (41 nationally)**
   1. Scientific leadership in each of three areas: laboratory, clinical and population-based research
   2. Substantial transdisciplinary research that bridges these areas
   3. Professional and public education and outreach, including dissemination of clinical and public health advances

2. **Cancer Centers (26 nationally)**
   1. Scientific leadership, resources and capabilities in laboratory, clinical or population science, or some combination of these three
   2. Reasonable depth and breadth of research in the scientific areas it chooses and transdisciplinary research across these areas

Source: National Association of Cancer Center Development Officers
What infrastructure?

Institutional Structure

Matrix/University (74%)
Hospital (4%)
Free-standing Cancer Center (22%)

Benefits & Challenges
Similarities & Differences
Funding Supports What Strategies and Actions?

• Formal, interactive **scientific research** programs

• Centralized shared resources (technologies, services, consultation)

• Strategic planning and evaluation

• Developmental funding to pursue newly identified priorities

• Centralized Cancer Center administration

• Centralized scientific oversight of cancer clinical trials
Population Sciences in Cancer Center Research

• WHY DO WE NEED POPULATION SCIENCE IN THE RESEARCH FOR CANCER PREVENTION AND CONTROL?
  • CAN WE PREVENT AND CONTROL CANCER (TREATMENT INCLUSIVE) WITH KNOWLEDGE GAINED FROM MOLECULAR-CELL-BASED RESEARCH ALONE?
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CAN WE PREVENT AND CONTROL CANCER (TREATMENT INCLUSIVE) WITH KNOWLEDGE GAINED FROM MOLECULAR OR CELL-BASED RESEARCH ALONE?

DOES DISEASE OCCUR BY CHANCE ALONE OR THERE IS ALWAYS A CAUSE?

AN OPPORTUNITY FOR POPULATION SCIENCES
What other research?

• EPIDEMIOLOGY – the fundamental population science in health
• Biostatistics
• Behavioral science
• Biomedical informatics research
• Translational research
• Implementation research
• Dissemination research
WHAT CHANGES?
HOW?

CURRENT LEGAL AND FISCAL CHANGES IN US HEALTH CARE HAS INCRFEASINGLY FORCED HEALTH CARE SYSTEMS TO MOVE AWAY FROM MEASURING AND MONITORING THE PATIENT TO FOCUSING MORE ON THE POPULATION WHICH GIVEN RISE TO PATIENTS OPPORTUNITY FOR POPULATION HEALTH SCIENCE FOR PREVENTION AND CONTROL OF CANCER
Health care changing

• From Fee-for Service to Value-based
• Payers want value, not volume
• Value Based Purchasing is transforming health care, by demanding;
  • Increased Quality
  • Increased Satisfaction
  • Lower Preventable outcomes
  • Lower per capita cost
  • Use Evidence-Based interventions
  • Use Population health indicators as units of measurement
More High-Performing Payer Organization

**Documentation**
- Claims Administration
- Sales & Marketing (Enrollment)
- Network Contract Management
- Risk Management
- Utilization Management

**Organization & Measurement**
- Disease Management
- Case Management
- Wellness Programs
- Claims analytics
- PCMH

**Collaboration & Improvement**
- Claims-based predictive modeling
- Advanced Utilization Management
- P4P and Quality payments
- Pharmacy benefit management

**Optimize Clinical and Financial Outcomes**
- Clinically-coordinated Quality Programs
- Clinical and Claims-based predictive modeling
- Enabling Payer/Provider Care Coordination
- Real-time integration: benefits admin. and care

**Source:** TriZetto
More High-Performing Provider Organization

**Affiliated**
- Documentation
  - Implement EMR
  - Collect data at Point of Care
  - Focus on episodic care

**Engaged**
- Organization & Measurement
  - Aggregate and Normalize data
  - Engage Providers
  - Measure against Payer-driven programs
  - View Community Info

**Coordinated**
- Collaboration & Improvement
  - Target high-value opportunities
  - Prioritize high-risk patients
  - Initiate care management
  - Identify gaps in care
  - Patient outreach
  - Closed loop analysis

**High-Performing**
- Optimize Clinical and Financial Outcomes
  - Utilize predictive modeling
  - Assess organizational risk
  - Manage cost & utilization
  - Enhance contract positioning
  - Improve the patient experience

**Fee for Service** | **Pay for Performance** | **Shared Savings & Bundled Payments** | **Shared Risk & Capitation**

SOURCE: TriZetto
Changes Leading to Population health

• Accountability, quality, value and efficiency are leading to creation of highly interconnected systems of care with need to:
  • integrate both the delivery of care and information on impactors of care;
  • manage service population in ways similar to the concept of public health: population health management
Objective is to Create a Comprehensive Population Health Management Workflow

SOURCE: TriZetto
Population Health

• Historically, the term “population health” has been more commonly used elsewhere than in the United States

• Definition: “the health outcomes of a group of individuals, including the distribution of the outcomes within the group”*

• The Triple Aim - defines 3 inter-dependent aspects:**
  - Improving the health of a population
  - Improving the patients’ experience of care
  - Reducing the per capita costs of care for populations

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* David Kindig, MD, PhD, and Greg Stoddart, PhD- Models for Population Health, AJPH 2003

**Don Berwick, Health Affairs – The Triple Aim: Care, Health and Cost, May 2008, vol. 27
Now Recall what Public Health is

• Public health promotes and protects the health of people and the communities where they live, learn, work and play.

• *prevent* disease and injury in *communities and populations*

• Identify the *causes of disease and disability*

• implement *large-scale solutions.*
Now Recall How Cancer Centers are Structured and Funded

• Cancer centers are **integral parts of the hospitals or health systems** delivering this new model of care
• It can no longer think only about treatment for one patient at a time – everything matters:
  • Cell – Molecular, precision medicine, genomics, etc.,
  • Person – genomics, behavioral, socio-determinants
  • **Population** – risk, outcomes, management, cost
  • Context – funding, partnerships, patient engagement
Evidence from one population sciences integrated in delivery of care: EPIDEMIOLOGICAL EVIDENCE
Increasing evidence strength:

- Invitro "test tube" research
- Animal Research
- Ideas, Opinions, Editorials
- Case Reports and Series
- Cross Sectional
- Case Control
- Cohort
- RCT
- Systematic Review/Meta-Analysis
  • Randomized Controlled Trial
  • Systematic Review/Meta-Analysis
TRIP searches filtered AND unfiltered information simultaneously.
WHAT DATA?

Do epidemiological studies need to change as type and volume of data changes?
HEALTH CARE SYSTEMS ARE RE-CREATING POPULATION HEALTH MONITORING: Adding new data sources, type of data while exponentially increasing data size
Example of A Collaborative Solution
Aggregating Data Across The Entire Healthcare Ecosystem - TriZetto
WHATE OTHER DATA: THE FORGOTTEN PARTNER OR ELEPHANT IN THE ROOM*: PUBLIC HEALTH ORGANIZATIONS MONITORING OF POPULATION HEALTH

* English metaphorical idiom for an obvious truth that is going unaddressed.
Public Health Surveillance Data Sources

- Vital Statistics
- Notifiable Diseases
- Registries
- Sentinel Surveillance
- Syndromic Surveillance
- Surveys
- Administrative Data
Data Source: Registries

- Information from multiple sources is linked for each individual over time.
  - Diverse sources of information. E.g., hospitals (sometimes >1), pathology, death certificates.
- Used for cancer, congenital anomalies, trauma, etc.
- Most are passive but resource intensive.
- More lag in data availability due to complexity of data collection process.
Populations Covered by Registries

• Hospital-based
• Population-based
• Exposure registries
  • World Trade Center Health Registry
  • Three Mile Island
CDC- Division of Cancer Prevention and Control

- Public Health
  - All cancer and all people - Population health inclusive
  - Practice, research and capacity building
- Health promotion
- Primary prevention
- Secondary prevention
- Tertiary prevention
NCI-Division of Cancer Control and Prevention

- Program Areas
  - Behavioral Research
  - Epidemiology + Genomics
  - Healthcare Delivery Research
  - Implementation Science
  - Surveillance
  - Survivorship