Value-Based Health Care Delivery

Professor Michael E. Porter
Harvard Business School

Introduction to Global Health Delivery
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This presentation draws on Michael E. Porter and Elizabeth Olmsted Teisberg: Redefining Health Care: Creating Value-Based Competition on Results, Harvard Business School Press, May 2006, and “How Physicians Can Change the Future of Health Care,” Journal of the American Medical Association, 2007; 297:1103:1111. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means — electronic, mechanical, photocopying, recording, or otherwise — without the permission of Michael E. Porter and Elizabeth Olmsted Teisberg. Further information about these ideas, as well as case studies, can be found on the website of the Institute for Strategy & Competitiveness at http://www.isc.hbs.edu.
Redefining Health Care Delivery

- Universal coverage and access to care are **essential, but not enough**
- The core issue in health care is the **value of health care delivered**

Value: Patient health outcomes per dollar spent

- How to design a health care system that **dramatically improves patient value**
  - Ownership of entities is secondary (e.g. non-profit vs. for profit vs. government)
- How to create a **dynamic system** that keeps rapidly improving
Creating a Value-Based Health Care System

• Significant improvement in value will require fundamental restructuring of health care delivery, not incremental improvements

Today, 21st century medical technology is delivered with 19th century organization structures, management practices, and pricing models

- TQM, process improvements, safety initiatives, disease management and other overlays are beneficial but not sufficient

- Consumers cannot fix the dysfunctional structure of the current system
Harnessing Competition on Value

• Competition is a powerful force to encourage restructuring of care and continuous improvement in value
  – Competition for patients/subscribers

• Today’s competition in health care is not aligned with value

Financial success of system participants ≠ Patient success

• Creating competition on value is a central challenge in health care reform
Zero-Sum Competition in U.S. Health Care

**Bad Competition**

- Competition to **shift costs** or capture greater revenue
- Competition to **increase bargaining power** to secure discounts or price premiums
- Competition to **capture patients** and restrict choice
- Competition to **restrict services**
- Competition to **exclude less healthy individuals**

**Good Competition**

- Competition to **increase value for patients**

**Zero or Negative Sum Competition**

**Positive Sum Competition**
Principles of Value-Based Health Care Delivery

1. Set the goal as value for patients, not volume of care or containing costs

\[
\text{Value} = \frac{\text{Health outcomes}}{\text{Costs of delivering the outcomes}}
\]

- Outcomes are the full set of patient health outcomes over the care cycle
- Costs are the total costs for the care of the patient’s condition, not just the costs borne by a single provider
## Principles of Value-Based Health Care Delivery

1. Set the goal as **value for patients**, not containing costs

2. Use **quality improvement** to drive cost containment and value improvement, where quality is **health outcomes**

<table>
<thead>
<tr>
<th>Prevention of disease</th>
<th>Fewer complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early detection</td>
<td>Fewer mistakes and repeats in treatment</td>
</tr>
<tr>
<td>Right diagnosis</td>
<td>Faster recovery</td>
</tr>
<tr>
<td>Early and timely treatment</td>
<td>More complete recovery</td>
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<tr>
<td>Right treatment to the right patients</td>
<td>Less disability</td>
</tr>
<tr>
<td>Treatment earlier in the causal chain of disease</td>
<td>Fewer relapses or acute episodes</td>
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<tr>
<td>Rapid care delivery process with fewer delays</td>
<td>Slower disease progression</td>
</tr>
<tr>
<td>Less invasive treatment methods</td>
<td>Less need for long term care</td>
</tr>
<tr>
<td></td>
<td>Less care induced illness</td>
</tr>
</tbody>
</table>

- **Better health** is the goal, not more treatment
- Better health is **inherently less expensive** than poor health
Principles of Value-Based Health Care Delivery

1. Set the goal as **value for patients**, not containing costs
2. Use **quality improvement** to drive cost containment and value improvement, where quality is **health outcomes**
3. Reorganize health care delivery around **medical conditions** over the **full cycle of care**

- A medical condition is **an interrelated set of patient medical circumstances** best addressed in an **integrated way**
  - Defined from the **patient’s** perspective
  - **Including** the most common co-occurring conditions
  - Involving **multiple** specialties and services

- The patient’s medical condition is the **unit of value creation** in health care delivery
Restructuring Care Delivery
Migraine Care in Germany

Existing Model:
Organize by Specialty and Discrete Services

- Imaging Centers
- Outpatient Physical Therapists
- Outpatient Neurologists
- Inpatient Treatment and Detox Units
- Outpatient Psychologists
- Primary Care Physicians

New Model:
Organize into Integrated Practice Units (IPUs)

- Imaging Unit
- West German Headache Center
  Neurologists
  Psychologists
  Physical Therapists
  Day Hospital
- Essen Univ. Hospital Inpatient Unit
- Network Neurologists

## The Cycle of Care
### Breast Cancer

| ENGAGING | • Advice on Self screening  
  • Consultations on risk factors | • Counseling patient and family on the diagnostic process and the diagnosis | • Explaining patient choices of treatment  
  • Patient and family psychological counseling | • Counseling on the treatment process  
  • Achieving compliance | • Counseling on rehabilitation options, process  
  • Achieving compliance  
  • Psychological counseling | • Counseling on long term risk management  
  • Achieving Compliance |
| --- | --- | --- | --- | --- | --- | --- |
| MEASURING | • Self exams  
  • Mammograms | • Mammograms  
  • Ultrasound  
  • MRI  
  • Biopsy  
  • BRACA 1, 2... | • Procedure-specific measurements | • Range of movement  
  • Side effects measurement | • Recurring mammograms (every six months for the first 3 years) |
| ACCESSING | • Office visits  
  • Mammography lab visits | • Office visits | • Hospital stays | • Office visits | • Office visits | • Office visits |
| ACCESSING | • Lab visits | • Hospital visits | • Visits to outpatient or radiation chemotherapy units | • Rehabilitation facility visits | • Lab visits  
  • Mammographic labs and imaging center visits |
| ACCESSING | • High risk clinic visits | | | | | |
| MONITORING/ PREVENTING | • Medical history  
  • Control of risk factors (obesity, high fat diet)  
  • Genetic screening  
  • Clinical exams  
  • Monitoring for lumps | • Medical history  
  • Determining the specific nature of the disease  
  • Genetic evaluation  
  • Choosing a treatment plan | • Surgery prep (anesthetic risk assessment, EKG)  
  • Plastic or onco-plastic surgery evaluation | • Surgery (breast preservation or mastectomy, oncoplastic alternative)  
  • Adjuvant therapies (hormonal medication, radiation, and/or chemotherapy) | • In-hospital and outpatient wound healing  
  • Treatment of side effects (e.g. skin damage, cardiac complications, nausea, lymphodema and chronic fatigue)  
  • Physical therapy | • Periodic mammography  
  • Other imaging  
  • Follow-up clinical exams  
  • Treatment for any continued side effects |
| PROVIDER MARGIN | ENGAGING | | | | | |
| PROVIDER MARGIN | ENGAGING | | | | | |
Integrated Care Delivery Includes the Patient

• Value in health care is **co-produced** by clinicians and the patient

• Unless patients **comply** with care and treatment plans and take steps to improve their health, even the best delivery team will fail

• For chronic care, patients **are often the best experts** on their own health and personal barriers to compliance

• Today’s fragmented system creates **obstacles** to patient education, involvement, and adherence to care

• Simply forcing consumers to pay more is a **false solution**

• **IPUs** will improve patient engagement
Primary Care as a Medical Condition
Prevention, Screening, Wellness, and Health Maintenance

• Today’s primary care structures are fragmented and attempt to address overly broad needs with limited resources

• Primary care should involve defined sets of prevention, screening, wellness, and health maintenance (PSH) services in organizations with sufficient expertise and support staff to achieve high value

• PSH IPUs should combine the range of expertise, support staff and facilities needed to deliver high value

• PSH care delivery organizations should focus on specific patient populations (e.g. healthy adults, frail elderly, type II diabetes) rather than attempt to be all things to all patients

• Primary care delivery structures should involve the workplace, community organizations, and other non traditional settings to leverage the efficiency and effectiveness of regular patient contact and the ability to develop a group culture of wellness
Principles of Value-Based Health Care Delivery

4. **Increase** provider experience, scale, and learning to drive value at the **medical condition level**

- The virtuous circle **extends across geography** when care for a medical condition is integrated across locations
## Fragmentation of Hospital Services
### Sweden

<table>
<thead>
<tr>
<th>DRG</th>
<th>Total admissions / year nationwide</th>
<th>Number of admitting providers</th>
<th>Average admissions/ provider/ year</th>
<th>Average admissions/ provider/ week</th>
<th>Average percent of total national admissions/ provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes age &gt; 35</td>
<td>7,649</td>
<td>80</td>
<td>96</td>
<td>2</td>
<td>1.3%</td>
</tr>
<tr>
<td>Kidney failure</td>
<td>7,742</td>
<td>80</td>
<td>97</td>
<td>1</td>
<td>1.3%</td>
</tr>
<tr>
<td>Multiple sclerosis and cerebellar ataxia</td>
<td>2,218</td>
<td>78</td>
<td>28</td>
<td>1</td>
<td>1.3%</td>
</tr>
<tr>
<td>Inflammatory bowel disease</td>
<td>4,816</td>
<td>73</td>
<td>66</td>
<td>1</td>
<td>1.4%</td>
</tr>
<tr>
<td>Implantation of cardiac pacemaker</td>
<td>6,324</td>
<td>51</td>
<td>124</td>
<td>2</td>
<td>2.0%</td>
</tr>
<tr>
<td>Splenectomy age &gt; 17</td>
<td>129</td>
<td>37</td>
<td>3</td>
<td>&lt;1</td>
<td>2.6%</td>
</tr>
<tr>
<td>Cleft lip &amp; palate repair</td>
<td>583</td>
<td>7</td>
<td>83</td>
<td>2</td>
<td>14.2%</td>
</tr>
<tr>
<td>Heart transplant</td>
<td>74</td>
<td>6</td>
<td>12</td>
<td>&lt;1</td>
<td>16.6%</td>
</tr>
</tbody>
</table>

## Fragmentation of Hospital Services
### Japan

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Number of hospitals performing the procedure</th>
<th>Average number of procedures per provider per year</th>
<th>Average number of procedures per provider per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Craniotomy</td>
<td>1,098</td>
<td>71</td>
<td>0.5</td>
</tr>
<tr>
<td>Operation for gastric cancer</td>
<td>2,336</td>
<td>72</td>
<td>0.5</td>
</tr>
<tr>
<td>Operation for lung cancer</td>
<td>710</td>
<td>46</td>
<td>0.3</td>
</tr>
<tr>
<td>Joint replacement</td>
<td>1,680</td>
<td>50</td>
<td>0.3</td>
</tr>
<tr>
<td>Pacemaker implantation</td>
<td>1,248</td>
<td>40</td>
<td>0.3</td>
</tr>
<tr>
<td>Laparoscopic procedure</td>
<td>2,004</td>
<td>72</td>
<td>0.5</td>
</tr>
<tr>
<td>Endoscopic procedure</td>
<td>2,482</td>
<td>202</td>
<td>1.4</td>
</tr>
<tr>
<td>Percutaneous transluminal coronary angioplasty</td>
<td>1,013</td>
<td>133</td>
<td>0.9</td>
</tr>
</tbody>
</table>

Principles of Value-Based Health Care Delivery

5. **Integrate care across facilities** and **across regions**, rather than Duplicate services in stand-alone units

- Excellent providers can manage care delivery **across multiple geographies**
Principles of Value-Based Health Care Delivery

1. Set the goal as **value for patients**, not containing costs
2. Use **quality improvement** to drive cost containment (and value improvement), where quality is health **outcomes**
3. Reorganize health care delivery around **medical conditions** over the **full cycle of care**
4. **Increase** provider **experience**, **scale**, and **learning** to drive value at the **medical condition level**
5. **Integrate care across facilities** and **across regions**, rather than duplicate services in stand-alone units
6. **Measure** and ultimately **report** value for every provider for every medical condition

- Outcomes should be measured for each **medical condition** over the **cycle of care**
  - Not for interventions or short episodes
  - Not for practices, departments, clinics, or hospitals
  - Not separately for types of service (e.g. inpatient, outpatient, tests, rehabilitation)

- Results must be measured at **the level at which value is created** not traditional organizational units
Measuring Value in Health Care

- **Patient Initial Conditions**
- **Processes**
  - Protocols/Guidelines
- **Indicators**
  - E.g., Hemoglobin A1c levels of patients with diabetes
- **Structure**
- **(Health) Outcomes**
The Outcome Measures Hierarchy

**Tier 1**
- **Health Status Achieved**
  - Survival
  - Degree of health/recovery

**Tier 2**
- **Process of Recovery**
  - Time to recovery or return to normal activities
  - Disutility of care or treatment process (e.g., discomfort, complications, adverse effects, errors, and their consequences)

**Tier 3**
- **Sustainability of Health**
  - Sustainability of health or recovery and nature of recurrences
  - Long-term consequences of therapy (e.g., care-induced illnesses)
## Swedish Obesity Registry Indicators

### Initial Conditions

- Demographics (age, sex, height, weight, BMI, waist circumference etc)
- Baseline labs – HbA1c (a measure of long-term blood glucose control), Triglycerides, Low Density Lipoprotein (bad cholesterol), High Density Lipoprotein (good cholesterol) Comorbidities (sleep apnea, diabetes, depression, etc)
- SF-36/OP-9 (validated quality of life measures)
- Background (Previous surgeries, anesthesia risk class)

### Surgery

- Operation type and concurrent operations (gall bladder removal, appendix removal, etc)
- Surgery data (surgery/anesthesia times, blood loss, etc)
- Perioperative complications

Source: SOReg: Swedish National Obesity Registry
6-week follow-up

- Length of stay
- Post operative but <30d surgical complications (bleeding, leakage, infection, technical complications, etc)
- Post operative but <30d general complications (blood clot, urinary infection, etc)
- Other operations required (gall bladder, plastic surgery, etc)
- Diabetes compliance (HbA1c)
- Repetition of anthropometric measurements (height, weight, waist, BMI, and change from initial)

1,2 & 5-year follow-up

- Anthropometrics and change from initial
- Diabetes, triglycerides, cholesterol indicators
- Comorbidities, and ongoing treatments
- Delayed complications of operation (hernia, ulcer, treatment related malnutrition or anemia, etc)
- Other surgeries since registration
- SF-36/OP-9 (validated quality of life measures)

Source: SOReg: Swedish National Obesity Registry
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5. **Integrate care across facilities** and **across regions**, rather than duplicate services in stand-alone units
6. **Measure** and ultimately **report** value for every provider for every medical condition
7. **Align reimbursement** with **value** and reward **innovation**
   - **Bundled reimbursement** for **cycles of care**, not payment for discrete treatments or services
   - Time-base bundled reimbursement for **managing chronic conditions**
   - Reimbursement for defined **prevention, wellness, screening, and health maintenance** service bundles
8. **Providers** and **health plans** should be proactive in driving new reimbursement models, not wait for government
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7. Align reimbursement with **value** and reward **innovation**
8. Utilize information technology to enable **restructuring of care delivery** and **measuring results**, rather than treat it as a solution itself

- Common data definitions
- Precise interoperability standards
- Architecture to combine all types of data (e.g. notes, images) for each patient
- Encompass the full care cycle, including referring entities
- Templates for medical conditions to enhance the user interface
- Accessible to all involved parties
Value-Based Health Care Delivery: Implications for Providers

• Organize around **integrated practice units** (IPUs)
  – Employ formal **partnerships** and **alliances** with other organizations involved in the care cycle

• Measure **outcomes** and **costs** for every patient by medical condition

• Lead the development of **new bundled reimbursement models**

• **Specialize** and **integrate** services across facilities
  – **Rationalize service lines/ IPUs** across facilities to improve volume, avoid duplication, and enable excellence
  – Offer specific services at the **appropriate facility**
    • e.g. acuity level, cost level, benefits of convenience
  – Clinically integrate care **across facilities** within an IPU structure
    • Common organizational unit across facilities
  – Link **preventative/primary care** units to IPUs

• Grow high-performing practices **across regions**

• Implement an integrated **electronic medical record** system to support these functions
Value-Based Healthcare Delivery: Implications for Health Plans

“Payor”

Value-Added Health Organization
The Developed World and Resource-Poor Settings Suffer from Similar Delivery Problems

<table>
<thead>
<tr>
<th>Current Model</th>
<th>New Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The product is <strong>treatment</strong></td>
<td>• The product is <strong>health</strong></td>
</tr>
<tr>
<td>• Measure <strong>volume</strong> of services (# tests, treatments)</td>
<td>• Measure <strong>value</strong> of services (health outcomes per unit of cost)</td>
</tr>
<tr>
<td>• Focus on overall facilities, <strong>specialties</strong> or <strong>types</strong> of practitioners</td>
<td>• <strong>Coordinated</strong> and <strong>integrated</strong> care delivery</td>
</tr>
<tr>
<td>• Discrete <strong>interventions</strong></td>
<td>• <strong>Care cycles</strong></td>
</tr>
<tr>
<td>• <strong>Individual</strong> diseases or overall facilities</td>
<td>• Sets of prevalent <strong>co-occurrences</strong></td>
</tr>
<tr>
<td>• <strong>Fragmented, localized,</strong> pilots. programs and entities</td>
<td>• <strong>Integrated</strong> care delivery systems</td>
</tr>
</tbody>
</table>
A Framework for Global Health Delivery

I. Care Delivery Value Chains for Medical Conditions

II. Shared Delivery Infrastructure

III. Aligning Delivery with External Context

IV. Leveraging the Health Care System for Economic and Social Development

Supporting Public Policies
## The Care Delivery Value Chain

### HIV/AIDS

<table>
<thead>
<tr>
<th><strong>INFORMING &amp; ENGAGING</strong></th>
<th><strong>MEASURING</strong></th>
<th><strong>ACCESSING</strong></th>
<th><strong>PREVENTION &amp; SCREENING</strong></th>
<th><strong>DIAGNOSING &amp; STAGING</strong></th>
<th><strong>DELAYING PROGRESSION</strong></th>
<th><strong>INITIATING ARV THERAPY</strong></th>
<th><strong>ONGOING DISEASE MANAGEMENT</strong></th>
<th><strong>MANAGEMENT OF CLINICAL DETERIORATION</strong></th>
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<tr>
<td>Prevention counseling on modes of transmission on risk factors</td>
<td>Explaining diagnosis and implications</td>
<td>Explaining course and prognosis of HIV</td>
<td>Explaining approach to forestalling progression</td>
<td>Explaining medical instructions and side effects</td>
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<td>Explaining co-morbid diagnoses</td>
<td>End-of-life counseling</td>
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<td>HIV testing</td>
<td>HIV testing for others at risk</td>
<td>CD4+ count, clinical exam, labs</td>
<td>Monitoring CD4+</td>
<td>Continuously assessing co-morbidities</td>
<td>Regular primary care assessments</td>
<td>HIV staging, response to drugs</td>
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<tr>
<td>TB, STI screening</td>
<td></td>
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<td>Lab evaluations for initiating drugs</td>
<td>Managing complications</td>
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<td>Collecting baseline demographics</td>
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<td>Regular primary care assessments</td>
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<td>Meeting patients in high-risk settings</td>
<td>Primary care clinics</td>
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<td>• Connecting patient with primary care</td>
<td>• Formal diagnosis, staging</td>
<td>• Determining method of transmission</td>
<td>• Initiating therapies that can delay onset, including vitamins and food</td>
<td>Initiating comprehensive ARV therapy, assessing drug readiness</td>
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<td>• Treating co-morbidities that affect disease progression, especially TB</td>
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<td>• Promoting appropriate risk reduction strategies</td>
<td>• Identifying others at risk</td>
<td>• Improving patient awareness of disease progression, prognosis, transmission</td>
<td>• Connecting patient with care team</td>
<td>Initiating comprehensive ARV therapy, assessing drug readiness</td>
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<td>• Modifying behavioral risk factors</td>
<td>• TB, STI screening</td>
<td>• Connecting patient with care team</td>
<td>• Initiating therapies that can delay onset, including vitamins and food</td>
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<td>• Pregnancy testing, contraceptive counseling</td>
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<td>• Preventing counseling on modes of transmission on risk factors</td>
<td>• Explaining diagnosis and implications</td>
<td>• Explaining course and prognosis of HIV</td>
<td>• Explaining approach to forestalling progression</td>
<td>• Explaining medical instructions and side effects</td>
<td>• Counseling about adherence; understanding factors for non-adherence</td>
<td>• Explaining co-morbid diagnoses</td>
<td>• End-of-life counseling</td>
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<td>• HIV testing</td>
<td>• HIV testing for others at risk</td>
<td>• CD4+ count, clinical exam, labs</td>
<td>• Monitoring CD4+</td>
<td>• Continuously assessing co-morbidities</td>
<td>• Regular primary care assessments</td>
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### Patient Value

| • Prevention counseling on modes of transmission on risk factors | • Explaining diagnosis and implications | • Explaining course and prognosis of HIV | • Explaining approach to forestalling progression | • Explaining medical instructions and side effects | • Counseling about adherence; understanding factors for non-adherence | • Explaining co-morbid diagnoses | • End-of-life counseling |         |
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### Health outcomes per unit of cost

- Identifying clinical and laboratory deterioration
- Initiating second- and third-line drug therapies
- Managing acute illnesses and opportunistic infection through aggressive outpatient management or hospitalization
- Providing social support
- Access to hospice care
Care Delivery Value Chain
Implications for HIV/AIDS Care

• **Early diagnosis** helps in forestalling disease progression

• **Intensive evaluation and treatment at the time of the diagnosis** can forestall disease progression

• **Improving compliance with first stage drug therapy** lowers drug resistance and the need to move to more costly second line therapies
Shared Delivery Infrastructure

Health Clinics <-> Community Health Workers <-> District Hospitals

- Testing Laboratories
- Tertiary Hospitals

Cross Cutting Issues
- Supply Chain Management
- Human Resource Development
- Insurance and Financing
Integrating “Vertical” and “Horizontal”

Care Delivery Value Chains

- HIV/AIDS
- Malaria
- Perinatal
- Tuberculosis

Shared Delivery Infrastructure

- Health Clinics
- Community Health Workers
- District Hospitals
- Testing Laboratories
- Tertiary Hospitals
Shared Delivery Infrastructure

Implications for HIV/AIDS Care

• Screening is most effective when integrated into a primary health care system

• Providing maternal and child health care services is integral to the HIV/AIDS care cycle by substantially reducing the incidence of new cases of HIV

• Community health workers not only improve compliance with ARV therapy but can simultaneously address other conditions
Integrating Delivery and Context

Care Delivery System

- Water & Sanitation
- Environmental Factors
- Nutrition
- Family/Community Attitudes and Support
- Health Awareness
- Access to Care Facilities

External Context for Health

Broader Influences

- JOBS
- HOUSING
- EDUCATION
- PHYSICAL INFRASTRUCTURE
- TRANSPORTATION

Environmental Factors

- Water & Sanitation
- Nutrition
- Health Awareness
- Access to Care Facilities
- Family/Community Attitudes and Support
Community health workers can have a major role in **overcoming transportation and other barriers to access and compliance with care**

Providing nutrition support can be important to **success in ARV therapy**

Integrating HIV screening and treatment into routine primary care facilities can help address the **social stigma** of seeking care for HIV/AIDS

Gender dynamics **limit the use of prevention options** in some settings

Management of **social and economic barriers** is critical to the treatment and prevention of HIV/AIDS
The Relationship Between Health Systems and Economic Development

Better Health Enables Economic Development

- Enables people to work
- Raises productivity

Health System Development Fosters Economic Development

- Direct employment (health sector jobs)
- Local procurement
- Catalyst for infrastructure (e.g. cell towers, internet, and electrification)
A New Field in Global Health

Basic Science → Clinical Science → Evaluation Science → Health Care Delivery Science

• What is the patho-physiology?
• What is the diagnosis and appropriate intervention?
• Does the intervention work?

Health Care Delivery Science

• How is the intervention best delivered?
• How can the overall delivery of care be integrated and optimized over the care cycle?
• What is the overall value of care (set of outcomes, costs)?