DELIVERING HOPE: CANCER CARE IN THE DEVELOPING WORLD
A LIVE**STRONG** BRIEF

AUGUST 2011

36 MILLION PEOPLE AROUND THE WORLD lose their lives to cancer, diabetes, heart disease and chronic respiratory diseases each year. Globally, they account for more deaths than any other cause. What is more startling is that 80 percent of deaths from these noncommunicable diseases (NCDs) occur in low- and middle-income countries.[1] No longer diseases of the wealthy, NCDs pose a major health and economic threat to us all.

In 2009, the World Economic Forum (WEF) ranked chronic diseases as the third most likely risk to the world economy and the fourth most severe in its economic impact. WEF estimated that the severity of economic loss caused by chronic diseases would be surpassed only by a potential oil and gas price spike, a reduction in globalization or asset price collapse. Furthermore, both the likelihood and severity of economic impact for chronic diseases are steadily increasing.[1] Presently, cancer alone costs $895 billion annually[2], and a 2010 update to the WEF global risk assessment matrix highlights chronic diseases as one of three trends that have "the potential for wider systemic impact," which is exacerbated by "greater resource constraints or short-term thinking."[3] The global burden of NCDs has the potential to limit productivity and economic growth nationally, regionally and internationally.

Currently, the development of policy around NCDs is often based on the assumption that the incidence of these diseases is limited to the rich or the elderly. Unfortunately, this assumption is incorrect. In fact, the poor often bear the double burden of both infectious and chronic disease. In addition, the cost of treatment and/or care for those with chronic diseases often causes a poverty trap for both individuals and their extended families.

Cancer accounts for nearly eight million deaths worldwide each year[4], killing more people than TB, AIDS and malaria combined. The situation is particularly dire in the developing world. In 1970, only 15 percent of new cancer cases occurred in the developing world. Currently, over half of new cancer cases and almost two-thirds of cancer deaths now occur in low-income and middle-income countries, and the burden is expected to grow. By 2030, it is estimated that 70 percent of the global cancer burden will be borne by the developing world.[5]

Many cancers are either preventable or treatable for those with means, but are still killing those without resources to fight the disease. Like other diseases such as drug-resistant TB or HIV/AIDS, cancer has traditionally been viewed as too complicated and costly to be treated. Historically, the dominant perception of cancer control was that treatment regimens were too complex, patients were uncooperative and treatment was a bad choice for resource allocation. We now know that these barriers can be overcome and people in even the most remote and challenging settings can receive the care they deserve.[6]

Effective and affordable strategies exist for each stage of the comprehensive cancer control continuum for countries at all stages of development. Furthermore, existing health systems designed to address communicable and other disease problems in low-resource countries can be leveraged to implement cancer control campaigns and interventions. Cancer prevention offers a cost-effective, long-term strategy for cancer control, and can include elements that are inexpensive and within the ability of lower-income

countries to finance, and if maximally applied, may prevent as many as one-third of cancers.[7] Prevention and treatment should not be seen as "either or" but should be viewed as both being essential, and with one strengthening the other. This has been shown to be true in the case of HIV/AIDS. Investments in diagnosis and treatment will vary depending on the resource level of the country, but should include emphasis on early detection to increase the cure rate, as well as the development of standardized, evidence-based treatment guidelines. Many diseases can be cured or effectively palliated with low-cost, off-patent drugs. Some of the higher cost, newer drugs are helpful in certain circumstances but this accounts for only a minority of cases. In addition, adequate palliation of pain and suffering should be considered a basic human right and be available to every patient, regardless of the setting. Drugs needed for palliation are inexpensive and can be readily available.

In order to effectively implement comprehensive cancer control in resource-limited settings, it is important to focus on interventions that will be the most effective and have the biggest impact on quality of life and survival. The chart to the right lists the core components for basic, effective cancer control that can apply even in settings of resource scarcity.

CORE ELEMENT	OPPORTUNITIES
Education and Awareness	• Community education and outreach to dispel common misperceptions • Embedding education into primary health care • Patient advocacy
Prevention and Risk Reduction	• Tobacco control[6] • Interventions targeting diet, body weight and activity levels • Vaccination (ex. HPV and Hepatitis B)[6] • Infectious disease control
Screening and Early Detection	• Education and awareness of warning signs (for health care providers and the general public)[8] • Standardized routine health care and screening, as appropriate[9]
Diagnostics and Staging	• Capacity to perform tumor biopsies • Capacity for high-quality pathology including immunohistochemistry • Implementation of revised staging criteria for cancers common in low- and middle-income countries
Treatment	• Basic surgery, both curative and to reduce symptoms • Investments in radiotherapy, equipment and training (suggested: cobalt or low complexity linear accelerators) • Systemic therapies; specifically with established regimens of off-patent drugs • Cross-training of nononcologists for delivery of care (ex. training nurses in chemotherapy delivery and symptom management) • Support from academic cancer centers in developed countries (twinning) • Psychosocial support interventions • Integration of WHO strategies for palliative care[10] • Policy change for improved access to essential medicines[11]
Surveillance and Monitoring	• Clinical and laboratory patient monitoring
Research	• Prospective research agenda to determine optimal health care infrastructures to facilitate cancer care and control, to assess implementation efforts and their effectiveness, to determine what works and what needs innovative approaches[6]

CANCER TYPE	OPPORTUNITIES
EXAMPLES OF DISEASES THAT ARE HIGHLY CURABLE WHEN DIAGNOSED AT AN EARLY STAGE AND TREATED APPROPRIATELY	
Cervical	• Prevention: primary prevention through vaccination against HPV • Early Detection: By HPV DNA testing, and/or community-based screening using VIA/VILI performed by nurses or community health workers • Treatment: Cryosurgery; excision (via LOOP, cone biopsy or simple hysterectomy); radiation when available; palliation
Breast	• Prevention: incorporation of healthy lifestyle recommendation into primary care and maternal/child health • Early Detection: education on signs of breast cancer and the need for routine breast examinations (can also be integrated into provision of primary care and maternal and child health); breast self-awareness and examination; clinical breast examination; mammography in communities with breast care infrastructure. • Diagnosis: core needle biopsies • Treatment: surgery; radiation therapy where available; hormone therapy; chemotherapy; palliation
Burkitt's Lymphoma	• Diagnosis: biopsy • Treatment: systemic chemotherapy
Hodgkin Lymphoma	• Diagnosis: biopsy; staging via CT scan • Treatment: systemic chemotherapy; optional radiation when available
EXAMPLES OF DISEASES THAT ARE AMENABLE TO LIFE EXTENSION AND PALLIATION WITH SYSTEMIC THERAPY	
Kaposi's Sarcoma	• Treatment: control of HIV infection with anti-retroviral agents in combination with systemic chemotherapy
Chronic Myelogenous Leukemia	• Treatment: systemic therapy; long-term, effective palliation

When resources are scarce, it is important to focus on conditions that are amenable to prevention, treatment and/or palliation. The table above outlines the opportunities to implement comprehensive cancer control for a subset of cancers. These are presented as examples of opportunities for improved care

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that are either amenable to curative approaches with early detection and treatment or life extension and palliation with systemic therapy.

The majority of agents that can be used in low-resource settings are off-patent and can be sourced at low prices as the chart on the next page demonstrates.

We must act now. We know what works, even in the most resource-constrained settings. The upcoming United Nations High-level Meeting on Noncommunicable Diseases presents a once-in-a-lifetime opportunity to mitigate the results of an impending global disaster.

ESSENTIAL ANTINEOPLASTIC AGENTS (FOR ADULT AND PEDIATRIC CANCERS)				
	Agent	Route of Administration	Patent Status	WHO Essential Drug List, 2010
1	Anastrozole, letrozole, exemestane	Oral	Off	No
2	Asparaginase	Parenteral	Off	Yes
3	Bleomycin	Parenteral	Off	Yes
4	Carboplatin	Parenteral	Off	Yes
5	Cisplatin	Parenteral	Off	No
6	Cyclophosphamide	Parenteral and Oral	Off	Yes
7	Cytarabine	Parenteral	Off	Yes
8	Dacarbazine	Parenteral	Off	Yes
9	Dactinomycin	Parenteral	Off	Yes
10	Daunorubicin	Parenteral	Off	Yes
11	Dexamethasone	Oral	Off	Yes
12	Doxorubicin	Parenteral	Off	Yes
13	Etoposide	Parenteral and Oral	Off	Yes
14	Fluorouracil (5_FU)	Parenteral	Off	Yes
15	Hydroxyurea	Oral	Off	Yes
16	Ifosfamide	Parenteral	Off	Yes
17	Imatinib	Oral	On	No
18	Leucovorin	Parenteral and Oral	Off	Yes
19	Melphalan	Oral	Off	No
20	Mercaptopurine	Parenteral	Off	Yes
21	Mesna	Parenteral and Oral	Off	Yes
22	Methotrexate	Parenteral and Oral	Off	Yes
23	Paclitaxel	Parenteral	Off	No
24	Prednisone	Oral	Off	Yes
25	Rituximab	Parenteral	On	No
26	Tamoxifen	Oral	Off	Yes
27	Trastuzumab	Parenteral	On	No
28	Vinblastine	Parenteral	Off	Yes
29	Vincristine	Parenteral	Off	Yes

Case study: Rwanda

Francine was the first patient treated for cancer by Partners In Health (PIH) in Rwanda. In 2006, she presented as an 11-year-old with a facial tumor that had been growing for over six months. Her family sought treatment from hospitals and traditional healers throughout Rwanda, and were repeatedly told nothing could be done. Eventually, a traditional healer in the Rwinkwavu area recommended she visit the PIH-supported Rwinkwavu Hospital.

Rwinkwavu Hospital was designed as a public district hospital with a comprehensive primary health care model. The approach was designed by Partners In Health to use HIV/AIDS prevention and care as the entry point to build capacity to address the major health problems faced by the population in a poor, rural area. Cancer was not something the PIH staff was expecting, or prepared to diagnose or treat. Francine's arrival raised a myriad of questions and challenges to delivering cancer care in the developing world.

Yet Francine's is a true story of hope. Despite the challenges, a biopsy was analyzed in collaboration with the Centers for Disease Control and Prevention and Francine was accurately diagnosed with embryonal rhabdomyosarcoma. A CT scan from a private hospital in Kigali supported that diagnosis. Though chemotherapy had not previously been performed at Rwinkwavu Hospital, Dr. Sara Stulac, a pediatrician and the Clinical Director of Partners In Health-Rwanda, made the decision with her colleagues to attempt treatment based on the risks and benefits of treating versus the certainty that Francine would die if not treated. This decision was not an easy one, and involved intensive support via e-mail from pediatric oncologists in the U.S. and meetings with medical staff and Francine's family. Dr. Stulac was able to acquire chemotherapy medications donated by a cancer center in the U.S. and she and the Rwinkwavu Hospital staff began treatment.

Francine went on to receive 45 weeks of chemotherapy in Rwinkwavu, and surgery in Kigali. She is now 15 years old and cancer free. Rwinkwavu Hospital continues to diagnose and treat cancer patients from throughout Rwanda, and its success of cancer care is contributing to the development of a national cancer plan.

PHOTO BY ALPHEUS MEDIA

THE RWINKWAVU HOSPITAL, WHERE FRANCINE RECEIVED TREATMENT. FRANCINE WAS THE FIRST CANCER PATIENT PARTNERS IN HEALTH TREATED.

PHOTO BY PARTNERS IN HEALTH

PHOTO BY ALPHEUS MEDIA

ELEVEN-YEAR-OLD FRANCINE, DIAGNOSED WITH EMBRYONAL RHABDOMYOSARCOMA (TOP PHOTO). FRANCINE, NOW 15, AFTER LIFE-SAVING TREATMENT (BOTTOM PHOTO).

Case study: Jordan

The King Hussein Cancer Foundation (KHCF) is an independent, nongovernmental, not-for-profit institution founded in 1997 by a Royal Decree to combat cancer in Jordan and the Middle East region. KHCF is the legal umbrella organization responsible for the King Hussein Cancer Center (KHCC), the Foundation's medical arm.

KHCC is the leading comprehensive cancer center in the Middle East, serving as a beacon of hope for so many suffering from cancer. KHCC treats over 3,500 new cases and provides treatment to over 7,600 inpatients, and 101,500 outpatients annually. KHCC is equipped with state-of-the-art medical equipment and services and has earned three international accreditations, two from the Joint Commission on Accreditation of Health Care Organizations (JCAHO) and one from the College of American Pathologists. It is the only center in the developing world and the sixth worldwide to be accredited by JCAHO as a disease-specific cancer center.

KHCC works closely with some of the best cancer centers in the world including the University of Texas MD Anderson Cancer Center, U.S.A., which is a sister institution to KHCC, St. Jude Children's Research Hospital, U.S.A., and many more. Leveraging the strengths of these partnerships through twinning programs and utilizing technological advances such as telemedicine, KHCC is able to participate in real-time consultations, share patient X-rays, other imaging studies and actual pictures and/or microscopic images, resulting in the latest quality cancer care. This approach has demonstrated significant results on outcomes and survival, and that highly specialized disease management for cancer can be successfully executed in the developing world.[12]

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THE KING HUSSEIN CANCER CENTER IN JORDAN, THE ONLY CENTER IN THE DEVELOPING WORLD AND THE SIXTH WORLDWIDE TO BE ACCREDITED BY JCAHO AS A DISEASE-SPECIFIC CANCER CENTER.

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ABOUT LIVE**STRONG** /LANCE ARMSTRONG FOUNDATON

LIVE**STRONG** serves people affected by cancer and empowers them to take action against the world's leading cause of death. Created as the Lance Armstrong Foundation in 1997 by cancer survivor and champion cyclist Lance Armstrong, the organization is now known publicly by its powerful brand—LIVE**STRONG**—and is a leader in the global movement on behalf of 28 million people around the world living with cancer today. Known for its iconic yellow wristband, LIVE**STRONG** has become a symbol of hope and inspiration to people affected by cancer around the world. Since its inception, the organization has raised more than $400 million for the fight against cancer. For more information visit LIVE**STRONG**.org.

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