Strengthening Chronic Disease Services in Ethiopia: Lessons Learned from HIV/AIDS Program Implementation

A National-Level Conference
Strengthening Chronic Disease Services in Ethiopia: Lessons Learned from HIV/AIDS Program Implementation

A National-Level Conference
December 3, 2010

Co-hosted by:
The Federal Ministry of Health
ICAP at Columbia University Mailman School of Public Health
The Ethiopian Diabetes Association
We acknowledge with thanks the contributions of Ms. Naomi Sugar to this report.

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Conference Background:

**Introduction:**
Recent years have witnessed a remarkable response to the HIV/AIDS epidemic. Fueled by local leadership, civil society involvement, the engagement of people living with HIV/AIDS (PLWH), multisectoral collaboration, and unprecedented funding, HIV/AIDS programs have become the first successful large-scale chronic disease initiatives in lower-income countries.

While HIV/AIDS remains a leading cause of mortality in sub-Saharan Africa and among women of reproductive age worldwide, other chronic diseases are also inflicting a significant and rapidly-growing impact in resource-limited settings. Unfortunately, the practical response to these accelerating epidemics in low and middle income countries (LMIC) has been tepid, despite calls to action and the fact that 60% of global deaths are due to cardiovascular disease, chronic respiratory illness, diabetes, and cancers.\(^1\) Health services in many under-resourced settings typically provide only episodic interventions. Delivery systems are often designed for the relief of acute symptoms, rather than the maintenance of well-being or the prevention, care, and treatment of chronic conditions. In addition, implementation of continuity care may be unfamiliar to policy makers and health workers, who lack effective local models to draw upon, and to patients accustomed only to acute or episodic care. From a practical perspective, marked shortages of appropriate space, staff, and infrastructure prevent health facilities from establishing continuity services, and the expense and difficulty of accessing care leads patients to defer the routine visits so critical for the prevention, monitoring, and treatment of chronic disease. The end result is the near-absence of large-scale service delivery models for chronic conditions in LMIC.

The creativity inspired by the scale-up of HIV services, including the expansion of workforce cadres, innovative financing and payment schemes, adherence support, and the upgrading of infrastructure, drug procurement, laboratory, patient tracking, and data systems, provides potential system-wide impact. Given the epidemiologic transitions of the 21st century, and the growing burden of chronic disease in LMIC, the practical lessons learned from the implementation and scale-up of HIV/AIDS programs have the potential to "jump start" high-quality longitudinal care for increasingly prevalent chronic conditions, such as diabetes and cardiovascular disease.\(^2\)

**HIV/AIDS Scale-up in Ethiopia:**
The Government of Ethiopia, with the support of its development partners, has made great progress against HIV/AIDS. HIV program scale-up has taken place in the context of national guidelines and policies, including the Program of Accelerated and Sustained Development and Ending Poverty (PASDEP) and the Health Sector Development Program (HSDP). The Federal Ministry of Health (FMOH), with the support of PEPFAR, the Global Fund, and other partners, has implemented a wide-ranging strategic plan to combat HIV/AIDS via a multisectoral public health approach. Health systems strengthening initiatives

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within the national AIDS program include strengthening procurement and lab systems, upgrading infrastructure, implementing a single national HIV/AIDS M&E system, and health workforce innovations (including the introduction of new cadres such as adherence advisors and data clerks, task-shifting and the creation of HANS nurses).

Working with the FMOH and Regional Health Bureaus, partners such as ICAP at Columbia University have also introduced new systems for implementation support and capacity building. These continuity care systems range from the introduction of decentralized point-of-care diagnostics, to appointment and defaulter tracking systems, to adherence support and peer education, enhanced linkages and referrals, innovative uses of data to guide programs and quality improvement, and cohort-based monitoring and evaluation strategies. While much remains to be done, Ethiopia’s HIV/AIDS program is its first national chronic disease initiative, with a wide range of locally-developed country-owned and contextually-appropriate tools, systems, and lessons to contribute to NCD program implementation.

**Conference Goals and Objectives:**
The goal of the national-level meeting was to strengthen health systems in Ethiopia by:

- Leveraging the experience and resources of HIV programs to enhance health systems’ response to other chronic diseases/NCDs;
- Identifying lessons, tools, resources, and systems developed by and for HIV implementers that can be used to accelerate the implementation of NCD services in LMIC;
- Fostering professional relationships, partnerships and communities of practice between experts in the “HIV” and “NCD” communities, to advance key clinical research and implementation science.

Meeting objectives included:

- Building interdisciplinary partnerships between HIV experts, NCD experts, policy makers, and health systems experts;
- Presenting data from implementation research exploring ways in which to leverage the practical lessons of HIV scale-up to strengthen prevention, care, and treatment services for adults and children with NCDs such as diabetes;
- Identifying key research questions on HIV and NCDs, as well as strategies to advance a priority research agenda.
# Meeting Agenda:

**Strengthening Chronic Disease Services in Ethiopia: Lessons Learned from HIV/AIDS Program Implementation**

December 03, 2010

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<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>8:30-9:00</td>
<td>Registration</td>
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<tr>
<td>9:00-9:30</td>
<td>Welcome (5 min)</td>
<td>Dr. Zenebe Melaku, ICAP Country Director in Ethiopia</td>
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<td>Welcome (5 min)</td>
<td>Dr. Ahmed Reja, EDA</td>
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<td>Opening remarks (10 min)</td>
<td>Dr. Wafaa El-Sadr, ICAP Global Director</td>
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<td>9:30 – 11:00</td>
<td><strong>NCDs: Challenges and Opportunities</strong></td>
<td><strong>Moderator: Professor Jemal Abdulkadir.</strong></td>
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<td>Global burden of NCDs (15 min)</td>
<td>Dr. Kunuz Abdela (WHO-Ethiopia)</td>
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<td>NCDs in Ethiopia (15 min)</td>
<td>Dr. Ismael Hassan (FMOH)</td>
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<td>Systems for NCD care in Ethiopia (20 min)</td>
<td>Dr. Ahmed Reja (EDA)</td>
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<td>Leveraging HIV scale-up for chronic disease services (20 min)</td>
<td>Dr. Miriam Rabkin (ICAP)</td>
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<td>Discussion (20 min)</td>
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<td>11:00-11:30</td>
<td>Tea/coffee</td>
<td><strong>Moderator: Dr Shitaye Alemu (University of Gondar)</strong></td>
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<td>11:30-12:15</td>
<td><strong>NCDs in patients with HIV:</strong></td>
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<td>State of the art lecture: Overview of the Metabolic Complications of HIV/AIDS (30 min)</td>
<td>Dr. Wafaa El-Sadr</td>
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<td>Discussion (15 min)</td>
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<td>12:15-1:15</td>
<td>Lunch</td>
<td><strong>Moderator: Professor Sileshi Lulseged (ICAP-NY)</strong></td>
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<td>1:15 – 2:00</td>
<td>Adama Hospital proof of concept study</td>
<td>Dr. Zenebe Melaku (ICAP)</td>
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<td>2:00 – 4:00</td>
<td>Small group discussions / working groups</td>
<td>Dr Shibru Berhanu (ICAP)</td>
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<td>Group I: Leveraging HIV Program Experience at the National Level</td>
<td>Facilitator: Wzo Mehret Hiluf &amp; Dr. Solomon Tessema (FMOH).</td>
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<td>Group II: Diagnosis and Enrolment</td>
<td>Facilitator: Dr Aschalew Endale (FMOH) &amp; Dr. Ayele Zewde (ICAP-Eth).</td>
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<td>Group III: Adherence and Retention</td>
<td>Facilitator: Dr. Abraham Endashaw (FMOH) &amp; Dr Damtew W/Mariam (ICAP-Eth)</td>
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<td>Group IV: HMIS, Monitoring, and Evaluation</td>
<td>Facilitator: Ato Dereje Mammo (FMOH) &amp; Dr. Tsigereda Gadisa (ICAP)</td>
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<td>Tea/coffee</td>
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<td>4:15-5:15</td>
<td>Feedback from small groups</td>
<td><strong>Moderators: Dr Ahmed Reja (EDA) &amp; Dr Miriam Rabkin (ICAP)</strong></td>
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<td>5:15 – 5:30</td>
<td>Wrap up / closing remarks</td>
<td>Dr. Wafaa El-Sadr: ICAP</td>
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Welcome, Introductions, and Opening Remarks

Figure 1: Dr. Zenebe Melaku, Dr. Wafaa El-Sadr, Dr. Keseteberhan Admassu, and Dr. Ahmed Reja

Dr. Zenebe Melaku, ICAP Ethiopia Country Director:

Honorable Minister, Professor El-Sadr, colleagues, and friends:

It is a pleasure to welcome you to what we believe will be a unique and productive meeting, one which brings together scientists, clinicians, and program managers from the fields of HIV and NCDs.

These two professional communities have recently celebrated both World Diabetes Day and World AIDS Day. By bringing colleagues together and bridging the divide between them, we hope to create more reasons to celebrate as we work together to expand chronic disease services of all kinds.

The moment is right to consider how the lessons learned from Ethiopia’s HIV/AIDS programs can be leveraged to support NCD services. 2011 will be a year of increasing NCD advocacy. The United Nations General Assembly will meet to consider NCDs in September of 2011, the first such meeting since the UNGASS on HIV/AIDS ten years ago. Donor funding for NCDs – now just 3% of global development assistance for health – is expected to rise. And the Ethiopian Ministry of Health has just launched the first national strategic framework for chronic disease.

In this context, we hope that our deliberations today will lead to immediate, practical outcomes. The remarkable scale-up of HIV/AIDS services in Ethiopia has created key lessons and provided a wealth of experience, tools, and systems to support continuity care for chronic diseases. We are confident that
these resources can be leveraged to “jump start” other chronic disease programs, and we know that the people in this room can help to make this happen.

Our conference today will include a panel presentation on NCDs in Ethiopia, an expert lecture on the metabolic complications of HIV/AIDS, and the results of a local study exploring the use of HIV-specific resources to support diabetes care and treatment. In the afternoon, we will come together in small working groups to deliberate on the way forward. We hope that today’s meeting will be the beginning of an ongoing partnership between the HIV and NCD communities in Ethiopia, one which will improve the health and life of millions.

Dr. Ahmed Reja, President, Ethiopian Diabetes Association:

Colleagues and friends:

I am very pleased today to welcome you to this important conference. The Ethiopian Diabetes Association has long worked with its partners and stakeholders to improve awareness of diabetes mellitus in Ethiopia, and to support prevention, care, and treatment services for individuals with diabetes.

Based on my experience, I can state with confidence that non-communicable diseases and HIV/AIDS are not competing priorities, but instead complement each other. In Ethiopia, the scale-up of HIV/AIDS programs has been remarkable effective in developing continuity care systems for chronic diseases. Individuals in the diabetes and other chronic disease communities can utilize these lessons to provide key services for diabetes patients and others with NCDs in Ethiopia and the rest of the world. The international community – including national diabetes associations in the African region – is eagerly awaiting the outcome of this conference.

I would like to thank you all for being here, and to offer special thanks to ICAP, for its commitment to this innovative partnership between the HIV and NCD communities.

Professor Wafaa El-Sadr, Director ICAP-Columbia University:

Good morning. I would like to begin by acknowledging the presence of Dr. Keseteberhan Admassu, the State Minister of Health, as well as Dr. Ahmed Reja, the President of the Ethiopian Diabetes Association. We are very pleased to have them with us today, as well as so many partners and colleagues from across the country.

This conference is an exciting opportunity to synergize and to work together in partnership, adapting lessons from HIV scale-up and using these valuable experiences and tools to benefit other patients living with chronic diseases.

At ICAP, we realized early on that in order to succeed in the confronting the HIV epidemic and to enable the establishment of effective HIV programs, one must take a health systems approach. For the past ten years, this vision of health systems strengthening has guided ICAP’s work, enabling us to
support the development of highly effective continuity care services for people living with HIV/AIDS. ICAP now works in 14 countries in sub-Saharan Africa, and is embarking on a new partnership with five countries in Central Asia, supporting Ministries of Health to provide key services to more than a million adults and children. ICAP works also hand-in-hand with other governmental, non-governmental, and community-based organizations in order to achieve mutual goals and objectives.

ICAP’s work extends beyond the support of HIV-specific programs, and includes broad support for health systems at the national, regional, district, health facility, and community levels. From this vantage point it is clear that the burden of disease in many countries includes not only HIV and other infectious diseases, but the unfinished agenda of maternal and child health, as well as the growing impact of non-communicable chronic diseases.

ICAP has played a leadership role in shining a light on the intersection of the response to HIV as a chronic communicable disease and the needed response to other health threats including chronic non-communicable diseases. ICAP has also played a key role in identifying the research agenda related to the assessment of the impact of HIV scale-up on health systems. And here in Ethiopia, we have piloted innovative research on leveraging the lessons of HIV programs to enhance diabetes services – a proof-of-concept study that will be presented later this afternoon. In Ethiopia, ICAP has also spearheaded use of the HIV program platform to strengthen maternal and neonatal child health services.

This unique conference may be the first time that some of you have met, as we strive to “bridge the divide” between the HIV and NCD communities. I hope we can learn from each other, lessons that will guide the way forward to achieve mutual goals and objectives – not only for HIV, or for NCDs, but for systems-wide changes for the benefit of all.

Dr. Keseteberhan Admassu, State Minister of Health, Ethiopian Federal Ministry of Health:

The Ethiopian Federal Ministry of Health has been working to confront non-communicable diseases (NCDs) and has seen remarkable progress in this area. Yet the prevalence and incidence of NCDs is growing each year. As such, NCD prevention and control is outlined in Ethiopia’s five-year health sector development plan. Part of this plan includes enrolling health extension workers for NCD care in rural Ethiopia in January 2011, which will provide a strong platform for prevention of NCDs.

In addition, the FMOH has developed an NCD framework and task-force and next steps include development of a program for each of the NCDs identified in this framework, including diabetes, cardiology, asthma, etc. In order to roll out each of these initiatives, the FMOH believes that it is important to strengthen hospitals, and as such are currently working to improve diagnostic capacity of six University Hospitals in Ethiopia which will ultimately become centers of excellence.

Today’s forum, which focuses on leveraging some of the best practices from HIV/AIDS care and treatment, will lead to program development for prevention, monitoring, control and care for other
chronic diseases in Ethiopia. In addition, the Ethiopian FMOH has immense experience in providing training for individuals who care for HIV patients, and this can be easily adapted to improve quality of care for other NCD patients. Together, we can make real progress towards improving the health and well-being of those at risk for and living with non-communicable diseases in Ethiopia.

I wish you good luck in your deliberations and look forward to the results.
Panel Presentations: Non-Communicable Diseases – Challenges & Opportunities

Moderator: Dr. Ywondossen Tadesse, Addis Ababa University Medical Faculty
Panelists: Wzo Gobane Dea, Federal Ministry of Health
Dr. Ahmed Reja, Ethiopian Diabetes Association
Dr. Miriam Rabkin, Columbia University ICAP

NCDs in Ethiopia – Wzo Gobane Dea, Ethiopian Federal Ministry of Health (FMOH)

Overview: The presentation provided an overview of Ethiopia’s National Strategy on Chronic Non Communicable Diseases (NCDs). Wzo Gobane Dea covered the following six subtopics:

- Background on NCDs
- Risk factors for NCDs
- Rationale for NCD strategy
- Key components of strategy
- Challenges
- Way forward

Background on NCDs Globally and in Africa

Chronic diseases are the leading cause of mortality in the world and contribute 60% of DALYS (disability adjusted life years). While chronic NCDs were originally thought to be associated with affluent societies, the epidemiologic shift has given rise to an increase in NCDs in developing countries. Contrary to common perception, 80% of chronic disease deaths occur in LMIC (lower and middle income countries) where chronic diseases affect younger populations and lead to premature mortality due to lack of prevention or effective management of the diseases or their risk factors. However, the growing burden of NCDs is gaining recognition worldwide, including in Africa. In the African region, NCDs will account for more than one-quarter of all deaths by 2015.

In 2008, the Ethiopian FMOH conducted a situational analysis and revealed that diabetes mellitus, cancer, cardiovascular disease, renal diseases and chronic obstructive pulmonary disease are amongst those with high burden. Maternal and child health, and communicable diseases like TB and HIV/AIDS, malaria were among the diseases of priority in the third Health Sector Development Plan (HSDP). In the fourth HSDP, NCDs are one area of intervention in the health sector and as such, the FMOH has devised new guidelines for urban health extension workers to help with early identification, referral, diagnosis, as well as create awareness on the risk factors associated with NCDs.
**Risk Factors for NCDs**

Some risk factors for NCDs include, but are not limited to the following: high intake of cholesterol and other energy rich diets; inadequate intake of fruits and vegetables; overweight or obesity; lack of physical fitness and smoking and alcohol intake.

**Rationale for NCD strategy**

The FMOH’s strategy is to have a shared commitment and consensus on the strategic direction; to control and prevent NCDs and their common risk factors; and to provide a framework for effective and efficient coordination of activities and resource mobilization. While vast, this strategy has several key components which include:

- Strengthening institutional capacity in the leadership and management of programs for the prevention and control of chronic diseases
- Advocacy, communication and social mobilization (ensure government commitment at all levels)
- Information, education and communication/behavioral change communication
- Integrating the prevention and control of chronic diseases with the health extension program
- Strengthening the diagnostic and clinical management capability of the health system in chronic disease care
- Epidemiological surveillance, research, M&E
- Strengthening the health management information system (HMIS)
- Enhancing the training of health professionals on chronic diseases
- Promoting public-private partnership
- Formulating and enforcing legislation (labeling of health hazards on cigarettes in local languages, impose taxation, etc.)

**Challenges and Future Directions**

While this strategy is well-outlined, it does have some inherent challenges, including the paucity of partners working on NCD prevention, care and treatment in Ethiopia, the lack of adequate evidence on NCDs, and limited funds to advance this project.

Nevertheless, it is imperative to move forward despite these challenges and limitations. As such, the FMOH is committed to addressing the diseases with highest burden such as diabetes, cancer, COPD, CVD, and renal disease. Resource mobilization has already started including MOH, WHO, and other stakeholders. Programs must address all levels within the health system, including community (awareness creation and early screening), and Woreda, Zonal and Regional levels (strengthening the program); at the university level (curriculum development). Furthermore, the FMOH has already created an NCD consortium which will help facilitate effective and efficient coordination of activities and maximize resource mobilization. Lastly, FMOH is committed to strengthening the national technical working group by inviting partners and other important stakeholders to help mobilize resources and efficiently harmonize efforts.
Introduction

Ban Ki-Moon UN Secretary General said: “Cancer, diabetes, and heart diseases are no longer the diseases of the Wealthy. Today they hamper the people and the economies of the poorest populations even more than infectious diseases. This represents a public health emergency in slow motion.” This quote is quite relevant to today’s discussion, and truly sets the stage for systems of chronic disease care in Ethiopia.

Dr. Reja’s presentation provided a brief overview of the health systems required for effective chronic disease care and treatment; highlighted NCD systems in Ethiopia; presented data from the ICAP situational analysis on systems of NCD care in Ethiopia; and presented challenges, opportunities and next steps in this domain.

Health Systems and Chronic Disease

Chronic diseases require a unique, health systems approach to care and treatment. From a diagnosis and enrollment perspective, chronic diseases require decentralized, widely accessible diagnostic testing; psychosocial and practical support for enrollment, adherence, and retention; robust referral and linkage systems; and uninterrupted supplies of medications and laboratory diagnostics.

From a health management perspective, all chronic diseases require trained and supervised multidisciplinary teams; health management information systems (HMIS) that support continuity care; and monitoring and evaluation systems appropriate for cohorts.

NCD Systems in Ethiopia: An Overview

Understanding the importance of these systems for chronic disease care and treatment, the FMOH in Ethiopia has taken some important steps to build an NCD system in Ethiopia. While the strategic framework for prevention and control of NCDs has been finalized, there currently is no program aimed at prevention and control of the most prevalent NCDs. Furthermore, there is no organizational unit to coordinate activities of prevention and management of NCDs, training of professionals is minimal and inadequate, there is a continuous shortage of health professionals, a lack of standardized protocols or clinical guidelines, and there are currently no systems of monitoring & evaluation of health professional performance. In conclusion, there are no organized or coordinated activities aimed prevention and control or clinical management of NCDs at the public or private health institutions in Ethiopia.
Despite the paucity of programs aimed at preventing and controlling NCDs in Ethiopia, chronic disease risk factors are prevalent in Ethiopians. In August 2009, a study was published in BMC Cardiovascular Disorders entitled "Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic," which noted that among Ethiopian males and females included in the study, 20% of males and 38% females were overweight; 2% of males and 10% of females were obese; 17% of males and 31% of females had a low level of total physical activity; and 32% of males and 29% of females had an elevated BP (140/90 mmHg).

**Reasons for Explosive Rise in NCDs**

There are many reasons for the substantial rise in NCDs in Ethiopia and across the globe. These include an aging population, epidemiological transition, and some behavioral factors as well such as higher rates of obesity and harmful lifestyles (including physical inactivity, unhealthy diet, smoking and alcohol abuse). In addition, harmful environments - unplanned urbanization and globalization, along with a rapid and unregulated economic transition – contribute to the explosive rise in NCDs.

**MDGs and NCDs**

The growing burden of NCDs will negatively impact progress toward the MDGs - we cannot let NCDs undermine the MDGs! NCDs are diseases of poverty, and this affects MDG1 directly as it hinders ability to eradicate extreme poverty and hunger; in the same way these NCDs also lead to poverty due to illness, loss of job, etc. Therefore, without addressing NCDs we will not bring about sustainable development in Ethiopia, or other countries.

**NCD systems – ICAP Situational Analysis**

In November 2010, ICAP conducted a situational analysis of NCD care in Ethiopia’s Oromiya Region in partnership with the Oromiya Regional Health Bureau. Using a convenience sample of 33 hospitals, ICAP utilized a short, standardized survey tool to explore the availability of chronic disease services for three conditions: diabetes, hypertension, and epilepsy.

The median number of adult NCD patients enrolled in care at these hospitals was 175 for diabetes (range 9-1,944), 197 for HTN (range 14-1935), and 89 for epilepsy (range 5-1691). The study findings show that few hospitals have designated clinics for NCD services, and most see NCD patients on an ad hoc basis along with other OPD patients. 27% of facilities surveyed have a designated DM clinic (usually an assigned day in which patients came to OPD); 21% of facilities have a designated HTN clinic (usually an assigned day in which patients came to OPD); and 21% have a designated epilepsy clinic (often within the psychiatric clinic).

Very few hospitals have appointment systems for NCD patients, i.e., an appointment book or other systematic way in which to determine when patients are expected and whether they miss appointments. None of the hospitals have defaulter tracking systems or other outreach for NCD patients who miss appointments. In addition, very few (3%) of hospitals have charting tools or forms to support continuity care for DM, HTN, and/or epilepsy (e.g., flow sheets, standard formats, checklists).
Key informant interviews echoed the points above:

- “Patient follow up is irregular and there is no proper data capturing and reporting system.”
- “No one knows when patients miss their appointments.”
- “There is no way to know if a patient misses an appointment…the staff only see the cards of patients who have come to clinic.”
- “When patients appear for follow-up, their cards are taken from the HMIS room to the OPD…”
- “No one follows patient appointments or knows when they are missed.”
- “There is no separate register for these patients.”

In addition, only one of the hospitals (3%) has provider support tools (such as wall charts, pocket guides, and table-top guides) for diabetes services; none have provider support tools for HTN and epilepsy. Only one hospital has SOPs for DM, HTN, and/or epilepsy; each provider acts independently, and only one hospital has any monitoring and evaluation system in place for chronic diseases other than HIV.

Access to equipment, medications, and laboratory diagnostics is variable from site to site (see Figure 4). Key informants cautioned that services are not always affordable, however, noting:

- “Medications are available to purchase, but there is always a shortage of free drugs for those who cannot afford to pay.”
- “There is a frequent shortage of all medications for those who cannot afford to buy them.”
- “There is a shortage of insulin and OHA for ‘free’ patients.”

**Figure 4: Access to illustrative equipment, medications, and laboratory diagnostics at the 33 hospitals**

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<thead>
<tr>
<th>Equipment/Diagnostic</th>
<th>% Hospitals Surveyed</th>
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<tbody>
<tr>
<td>On-site creatinine testing</td>
<td>76%</td>
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<tr>
<td>On-site fingerstick blood glucose</td>
<td>88%</td>
</tr>
<tr>
<td>Working ophthalmoscope</td>
<td>36%</td>
</tr>
<tr>
<td>Both insulin and OHA in stock</td>
<td>94%</td>
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**Challenges, Opportunities and Next Steps**

A substantial number of challenges exist, which, if not properly addressed, will hinder the progress towards system-wide NCD care and treatment in Ethiopia. First, there is no formal, organized NCD healthcare delivery system in Ethiopia, despite the increasing NCD healthcare needs. Secondly, there are inadequate or intermittent training programs for health professionals, often a product of competing priorities in an already strained healthcare system. In addition, the unavailability of diagnostic
equipment, poor access to healthcare, low patient attendance, illiteracy and cultural beliefs continue to threaten the widespread scale-up of NCD care in Ethiopia.

While much work needs to be done in the areas of patient education, access to equipment, medications, diagnostics, and monitoring and evaluation, there are many opportunities for growth and transformation in NCD care and treatment. NCDs should be included in Health Sector Development Program IV and the efforts and commitment of the MOH, NGOs, and NCD Consortium should be leveraged effectively. Lastly, the upcoming UN Summit in September, 2011 will provide a platform to advocate for continued support for NCD care in Ethiopia, and hopefully engage key stakeholders in this shared vision.

In order to continue strengthening chronic disease services in Ethiopia, it is essential to understand the incidence, prevalence, and distribution of NCDs in Ethiopia. Developing meaningful epidemiologic studies and securing relevant data will ultimately help inform policy on NCD services. In addition, it is essential to create, strengthen and integrate NCD clinics into primary care, standardize clinical care, and promote devolution of chronic care. Furthermore, we must improve diagnostic and therapeutic facilities and design and implement workable referral and networking systems. We must not underestimate the power of advocacy at this level, and we need to increase public awareness of NCDs and prevention of risk factors, foster public-private partnerships, and increase the role of associations of patients and professionals. Perhaps, however, most central to this conference, is the need to learn from the successes of HIV, TB and MCH program integration, and leverage these lessons for chronic disease care and treatment, and program implementation in Ethiopia.

**The Ethiopian Diabetes Association**

The Ethiopian Diabetes Association (EDA) was established in 1984 and registered under the Ethiopian Ministry of Justice. It is the first patient-based association in Ethiopia, with 32 branch offices and more than 10,000 members throughout the country. The EDA is a member of the International Diabetes Federation, Global & Africa Region, and is quite active in patient education. For the past 20 years, the EDA has been conducting educational sessions at Black Lion Hospital with the assistance of volunteer professionals.

The EDA works closely with a number of associations, federal agencies and nongovernmental organizations, including the FMOH, International Diabetes Federation (IDF), World Diabetes Foundation (WDF), and ICAP at Columbia University. The EDA conducts public awareness activities and has 32 branch offices all across Ethiopia, while continually strengthening and establishing new branches.

Finally, the EDA provides a number of patient support programs including free blood glucose tests, free insulin and glucose meter distribution (for especially needy patients), free digital camera screening for diabetic retinopathy (the first in all of Africa), training on clinical practice guidelines and a diabetes education manual.

More information about the Ethiopian Diabetes Association is available at its website: [www.diabetesethiopia.org.et](http://www.diabetesethiopia.org.et)
Overview

Dr. Rabkin opened her presentation by remarking that it is a great pleasure to see both the HIV and NCD communities together: “This morning’s presentations have highlighted the challenges facing Ethiopians with or at risk for NCDs. We have learned that there are also many opportunities, not the least of which is the political will and FMOH leadership to address this ‘crisis in slow motion,’ as Dr. Reja described it. My presentation will address how we may be able to use the lessons, systems, and tools from local HIV programs to accelerate the introduction of high-quality NCD programs in Ethiopia.”

Dr. Rabkin’s talk focused on the following three issues:

- Unifying characteristics of chronic diseases
- Learning from success: how have HIV programs implemented effective continuity care in resource-limited settings?
- Leveraging HIV programs to strengthen chronic disease services: three suggestions

“Chronic Disease” versus “Non Communicable Disease”

There are several different and complementary conceptual frameworks and definitions for “NCDs”. Today’s presentation will focus on enabling health systems to provide secondary prevention, care, and treatment for adults and children who already have the chronic conditions in question. This is not to suggest that more ‘upstream’ interventions are less important, or that they have nothing to learn from HIV programs.

What is chronic disease? Generally speaking it has a long duration and requires self management and lifelong adherence. Chronic diseases progress slowly and therefore early engagement in care is key. In addition, chronic diseases are often preventable and individuals can be asymptomatic or symptoms can wax and wane over time. Lastly, risk factors – some of which are genetic, and others of which are environmental – may cluster in families, households or communities.

From an individual’s perspective, chronic disease management requires regular and sustained interaction with the health care system and must incorporate responsibility for managing health and self-care into daily behavior. In addition, chronic disease management requires sustained healthy behaviors such as drug adherence, proper nutrition, smoking cessation, and patients must be able to access psychosocial support services to assist with the emotional and social impact of chronic illness.

From a health systems perspective, chronic disease management requires a coordinated array of services, illustrated in Table 1:
Table 1: Characteristics of chronic disease programs from the health systems perspective

<table>
<thead>
<tr>
<th>Diagnosis and enrollment</th>
<th>Identification of risk factors, early diagnosis, opportunistic case-finding, point-of-service diagnostics, standardized diagnostic protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention and adherence</td>
<td>Appointment systems, defaulter tracking, patient counseling, expert patients, secure medication supply chains, pharmacy support</td>
</tr>
<tr>
<td>Multidisciplinary family-focused care</td>
<td>A multidisciplinary team of healthcare providers and community members delivers care in partnership with the patient</td>
</tr>
<tr>
<td>Longitudinal monitoring</td>
<td>Health information systems have standardized and easily retrievable data</td>
</tr>
<tr>
<td>Linkages and referrals</td>
<td>Links within the health facility (to lab, pharmacy, others), between facilities, and between facility &amp; community</td>
</tr>
<tr>
<td>Self management</td>
<td>An informed, motivated patient is an effective manager of his/her own health</td>
</tr>
<tr>
<td>Community linkages and partnerships</td>
<td>Need functional partnerships between health facility-based providers and community-based groups that facilitate access to services across the care continuum</td>
</tr>
</tbody>
</table>

The situational assessment conducted by ICAP at 33 hospitals in the Oromiya Region, highlights the fact that very few health facilities have systems in place to support continuity care for chronic diseases such as diabetes, hypertension, and epilepsy – even if these systems are in place “down the hall” at the HIV clinic. It will come as no surprise to you that this is true everywhere we look, not just in Ethiopia. A similar site assessment in Swaziland showed that none of the facilities surveyed had appointment systems or defaulter tracking for patients with diabetes or hypertension, despite the fact that these services were in place for HIV patients at the same facilities. Only 27% of sites surveyed had on-site medical records, and only half of these (14%) used any kind of charting tools for diabetic or hypertensive patients. There are simple, powerful steps that can be taken to improve the quality and effectiveness of NCD services – and the tools and resources are often locally available, accepted, and validated.

“Bridging the Divide”

The distinction between non-communicable chronic diseases and communicable chronic diseases is an historic and administrative one. Yet it may not always be helpful when developing continuity care programs. HIV/AIDS programs are often the only large-scale local model of continuity care, but they are often overlooked by NCD program developers.

In keeping with the theme of “bridging the divide” it is important to leverage lessons - both positive and negative - from HIV programs, and use these successes to help implement effective continuity care in resource limited settings.

The successful scale-up of HIV/AIDS services in resource limited settings is due, in part to civil society engagement, advocacy by and for people living with HIV/AIDS, effective activism for access, quality care, and drug financing. This change in mindset from the impossible to the achievable ultimately contributed to the widespread scale-up of effective HIV/AIDS services. As a result, systems-wide changes were put
into place, including simplified and standardized protocols for diagnosis, management, monitoring and referral, which ultimately were endorsed by WHO and adopted as clinical guidelines. It was these principles that set the stage for standardized first and second line drug regimens, and the advocacy efforts that helped put pressure on pharmaceutical companies to lower prices, engage in generic testing tools, and increase drug access.

From a treatment perspective, decentralization to the district level marked an important step in shifting the locus of care from the Federal or National Ministry level, to the local health system level. At the same time, districts developed and standardized “packages of care” which included infrastructure, equipment, supplies, drugs, clinical and psychosocial services, medical records, and monitoring and evaluation tools to promote effective HIV/AIDS care and treatment. Task-shifting from physicians to nurses and other cadres enabled, for example, nurse-initiated ARVs, and HIV testing by trained laypeople. Systems were also put in place to strengthen procurement and supply chain management, monitoring stock outs to ensure continual drug access.

In 2004, the WHO developed the “Three Ones” Principles, which promoted one national HIV/AIDS framework that provides the basis for coordinating the work of all partners; one national AIDS coordinating authority, with a broad-based multisectoral mandate, and one country-level monitoring and evaluation system. The “Thee Ones” Principle could set the stage for other chronic disease programs, recognizing the need to create unified simplified and contextually appropriate diagnosis, enrollment, treatment and evaluation protocols.

**Leveraging HIV Programs to Strengthen Chronic Disease Services: Three Suggestions**

Dr. Rabkin made three suggestions for leveraging HIV programs to strengthen chronic diseases: taking a population health approach to service delivery; adapting existing systems and tools designed and developed within HIV programs, where appropriate; and screening people living with HIV/AIDS for other chronic diseases.

Firstly, the population health approach may be informed by several lessons from HIV/AIDS scale-up. Policy makers and program implementers may benefit from considering the “three ones” principle and developing simplified, standardized protocols (not just guidelines) for diagnosis, referral, care and treatment. Programs must support an explicit “minimum package” of clinical, lab, and pharmacy services and equipment. Monitoring and evaluation are critical components of this approach, and simple, powerful programmatic indicators (enrollment, retention, adherence, and outcome) are essential. Lastly, decentralization from the federal to district level will facilitate effective program implementation that engages key stakeholders.

Secondly, where appropriate, program managers should adapt existing systems and tools designed, developed and piloted within local HIV programs. These systems and tools include point-of-service diagnostic with ‘real time’ linkages to care; adherence support, expert clients, and peer educator programs; task-shifting and multidisciplinary teams; use of data at site/facility level to guide program improvement, and longitudinal monitoring and evaluation. In some contexts, integrating or co-locating chronic disease (continuity care) services may be appropriate, such as the MSF chronic disease clinics in
Cambodia which included services for HIV, diabetes and CVD. In others, HIV programs can be used to “jumpstart” parallel programs for other chronic diseases. In Ethiopia, for example, ICAP is working to adapt HIV tools and systems to support care of diabetic patients, but has not co-located services.

Thirdly, it is imperative to routinely screen and treat PLWH for other chronic diseases and their risk factors. As HIV treatment scale-up continues, an increasing number of PLWH will live long enough to develop other chronic diseases. Currently millions of people living with HIV/AIDS are enrolled in care and treatment programs in LMIC and more than 5 million of them are on ART. Furthermore, metabolic complications of HIV and some ARVs increase the risk of other chronic diseases and risk factors (including diabetes and hyperlipidemia), thus underscoring the importance of routine screenings.

HIV and NCD programs are traditionally “silohed” throughout the health system, from the facility level to the MOH level up through the WHO level. Thinking beyond traditional departments and clusters with a “health systems” perspective may strengthen individual programs and may also enable a more holistic approach to the delivery of primary care services attuned to the local burden of disease. In conclusion, if the Declaration of Alma Ata were written today, it would very likely include access to continuity care for chronic diseases as a key element of primary care—and we must continue to strive for this level of integration.

Discussion and Questions

Figure 6: Dr. Miriam Rabkin, Dr. Ywondossen Tadesse, Wzo Gobane Dea, and Dr. Ahmed Reja
Following the presentations by Wzo Gobane Dea, Federal Ministry of Health; Dr. Ahmed Reja, Ethiopian Diabetes Association; and Dr. Miriam Rabkin, ICAP Columbia, the conference participants discussed the following questions and answers.

1. When NCDs were listed in Wzo Gobane Dea’s presentation, why weren’t psychiatric conditions included?

Mental diseases were discussed briefly in this study, but it was hard to be very comprehensive in a short presentation time. It is worth noting, however, that mental health has its own task force and program and therefore it is not being neglected.

2. Why do the Millennium Development Goals (MDGs) overlook NCDs? They are currently affecting our lives and our economy, and cancer kills more people than HIV/TB and malaria combined. So, why were cancer and other NCDs overlooked?

The MDGs overlook NCDs for a variety of reasons. Until recently there was not a dedicated team to work on NCDs, and people viewed them as diseases of affluence. MDGs, on the contrary, were targeted at developing and in-transition countries, where NCDs were not considered priorities. This is a challenge, and perhaps explains why NCDs were not included. Only over the past few years have NCDs attracted attention, and only this year, in Ethiopia, have they developed the strategic framework for NCDs. This is a new commitment to NCDs that has not been present in the past.

In addition, the stigma associated with HIV is different from that of other chronic diseases, so integrating chronic diseases with HIV will help remove HIV stigma, and could actually be beneficial. In addition, it could help NCDs from a budgeting perspective. Dr. Ahmed would like to see these HIV and NCD systems combined and integrated for these reasons.

3. What do you mean by integrating HIV and NCD services at the point-of-care level?

This question illustrates that there are many different ways to integrate programs – and that “integration” can mean different things at different levels of the health system. At the facility level, I was making the distinction between integration of programs and co-location of programs. For example, there could be a shared clinic that has support staff in common, but which dedicates different days to different chronic diseases – seeing HIV patients on Mondays and diabetic patients on Tuesdays, for example. The systems – charting tools, appointment systems, adherence support, M&E protocols – could be identical, but the clinical care would be disease-specific. Another way would be to use the Cambodia model where staff is cross-trained, so they see all types of chronic diseases at the same time. Or, as in Adama, patients with chronic diseases could be seen at parallel clinics – or in HIV clinic on the one hand, and OPD on the other. There is no right way to address this; instead we need to think about what works best for each particular setting. There are lots of opportunities to pilot different models and see which work best. One of the biggest lessons from HIV was to engage stakeholders, and this should absolutely be applied to NCDs to see what the patients want, and what best meets their needs.
4. When you talk about population health, it differs according to communities so in developing programs how would you handle this in the absence of data?

It is hard to understate the importance of understanding the epidemiology of specific health conditions – the incidence, prevalence, and distribution of conditions that impair health and livelihoods at the community level. But this should not prevent us from moving ahead with systematic approaches. We know that there are 10,000 members of the Ethiopian Diabetes Association, so clearly those services are needed. But it is hard to generate targets without good data. We need to call for prevalence data to help in program development and implementation. For example, the DHS might provide an opportunity to obtain biomarkers for NCDs, as well as information on HIV prevalence. Data are needed, but are expensive – so there is an opportunity for advocacy here. Not only do we want resources allocated for services, but also for research. This is an opportunity for us to be advocates; not only advocates of care, but also advocates of research so that we can further improve NCD programs.

5. One of the challenges discussed in Dr. Reja’s talk was lack of evidence, but when you discussed future opportunities you did not discuss the role of research to generate evidence. Does anyone have a comment on this fact?

At different levels there are different duties to address NCDs. All universities are supposed to develop curriculum and engage in research. Research should be included more but it was not the main focus of this talk.
**State-of-the-art Lecture: Metabolic Complications of HIV/AIDS**

**NCDs in patients with HIV: Moderator – Dr. Solomon Zewdu (Johns Hopkins University)**

Dr. Solomon Zewdu opened with this quote: “There are 2 types of people when it comes to HIV: either those that live with HIV or those that are at-risk of getting it, and that’s it!” This phrase should be applied directly to NCDs as well and sets the stage for the upcoming presentation by Professor Wafaa El-Sadr.

<table>
<thead>
<tr>
<th>State of the art lecture:</th>
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<tbody>
<tr>
<td>Overview of the Metabolic Complications of HIV/AIDS</td>
</tr>
<tr>
<td>Professor Wafaa El-Sadr, Director of ICAP</td>
</tr>
</tbody>
</table>

Dr. El-Sadr focused on the following topics: the epidemiology of HIV, evolution of morbidity and mortality, spectrum of HIV-related complications, pathogenesis of non-AIDS complications and conclusions.

**The epidemiology of HIV**

In the traditional model of HIV infection, the natural history of the disease is marked by initial infection, a burst of viremia which is rapidly controlled by the host, and then a long, slow decline in CD4 count associated with a period of “clinical latency” in which not much goes on between the host and the virus. Our initial understanding was that disease progressed slowly, and death occurred after many years, after CD4 counts fell low enough to enable opportunistic infections such as Kaposi’s sarcoma, *Pneumocystis pneumonia*, tuberculosis, and cancers to manifest. Not surprisingly, most of the attention, understanding, and research have been focused on these AIDS-associated causes of morbidity and mortality.

With the discovery of effective HIV-treatment and with expansion of patients on effective ART, death rates have dropped dramatically in both resource-rich and resource-poor settings. In the United States, age-adjusted rates of death due to HIV infection plummeted between 1987 and 2000. Emerging data from resource-limited settings is showing a parallel phenomenon. In South Africa, a few years after ARV scale-up (2003-2006) we see mortality is leveling off, or decreasing with the rise of ART coverage.

**Evolution of Morbidity and Mortality**

While there are some remarkable advances in HIV treatment, there are also some negative implications of treatment. First, a positive association between hyperlipidemia and ART shows that with the use of certain protease inhibitors we see an increase in LDL and triglyceride levels. Even early on, there was some concern about the long-term effect of hyperlipidemia and cardiovascular disease. In 1998, a seminal article in the *New England Journal of Medicine* outlined the current concerns about HIV and lipodystrophy, and that same year the *Lancet* published early reports of premature coronary artery
disease and myocardial infarctions in young HIV-infected patients receiving protease-containing ART regimens.

As research progressed, and as people with HIV began to live longer due to ART, a full spectrum of other conditions started to emerge: liver-related deaths, hepatitis, cancers, and other conditions, giving a sense that there was something else going on – that PLWH were succumbing to other non-AIDS related complications. A key question is whether patients at higher risk of these other diseases because of the HIV virus itself or because of the treatment? These are two entirely different scenarios that inform different programmatic responses.

Figure 7: The spectrum of non-AIDS related complications emerges

New data began to show that HIV infection is associated with an increased risk for lung cancer, independent of smoking. Furthermore, among HIV-positive black Americans, there was an increased risk of end stage renal disease (ESRD), suggesting that HIV itself is associated with ESRD. Likewise, there is an increased risk of cardiovascular disease among HIV-infected versus uninfected individuals. And, an interesting study looked at the association between HIV and liver disease; in HIV infected hemophiliacs there was a substantial rise in the 25-year cumulative risk of liver death as compared to non-HIV infected hemophiliacs.

The range of non-AIDS-related complications has been increasing dramatically from pulmonary, cardiovascular, renal, skeletal/muscle, and malignancies in endocrine, reproductive and metabolic areas. For example, a 2003 study noted an increased incidence of diabetes amongst HIV-positive patients on protease inhibitors. Subsequent studies furthered this point, noting that diabetes is 3.1 times as likely to develop in those on ART as in control subjects over 3 years. A number of studies have set out to
determine the association between HIV and insulin resistance and its pathogenesis. First, protease inhibitors are thought to be a cause of insulin resistance, an example of which is Indinavir which inhibits Glut4, an intracellular glucose transporter. Additionally, fat redistribution is itself a cause of insulin resistance; in non-HIV patients, central adiposity, especially visceral adipose tissue (VAT) is associated with insulin resistance and increased FFA.

Evidence from a large observational study, the DAD study, has demonstrated that with increased exposure to ART, particularly certain antiretroviral drug classes and certain drugs within classes, there was an increased incidence of myocardial infarction (MI). So what is the cause of this? This study showed that there were many predictors of myocardial infarctions, including smoking, family history, previous CVD, but even when adjusted for all of these, ART per additional year of treatment was still associated with an increased risk of MI. This association was particularly noted with use of protease inhibitors. It is important however to note that the benefits of these drugs in preventing morbidity and mortality in HIV are notable and thus one must weigh the risks versus benefits in selection of specific regimens for treatment.

**Pathogenesis of HIV Associated Complications**

Why are these complications occurring among HIV positive patients? Contributing factors include the host (family history, smoking, genetics), HIV (the virus itself could be a primary reason for complications) and ART (the treatment for HIV). The data suggest that ART itself, or some aspects of it, are associated with increased risk of non-AIDS related complications. But the benefits of ART are well-known – it saves lives, and of course, the benefits outweigh the risks.

**SMART Study – New England Journal of Medicine, 2006**

The SMART study enrolled patients with high CD4 counts (greater than 350) and randomized them into a virologic suppression strategy of continuous ART (n=3000) or a drug conservation strategy of intermittent ART (n=3000). The hypothesis was that maintaining continuous treatment would lead to fewer opportunistic infections, but that intermittent treatment would perhaps yield fewer non-AIDS related complications because patients would not be on ART as long.

The findings supported part of this hypothesis – but with a twist. Unsurprisingly, there was an increased risk of OI and death amongst those receiving intermittent treatment. But what surprised everyone was that continuous ART was associated with decreased risk of serious AIDS and non-AIDS events. So what was going on? Why would effective HIV treatment reduce the risk of non-AIDS events?

The unifying theme might have to do with other markers that have not been studied thus far. When the drug conservation group in the SMART study stopped ART at baseline as per study design, an increase in inflammation was seen. When people were on treatment, inflammation stayed low. So antiretroviral treatment was associated with a decrease in some inflammatory and coagulation markers, which might explain why they were less likely to have these non-AIDS related complications. However, more research is needed to further define the role of ART, inflammation and HIV related complications.
A Unifying Framework: HIV-Associated Immune Activation

HIV-associated immune activation has been recently recognized as a potential mechanism that explains the “non-AIDS-related” complications observed in HIV-infected patients. The common assumption until recently was that there were years of “clinical latency,” but current research counters this. Instead, it appears that there is ongoing damage even during this “latency” period that affects the heart, bones, and other systems and can lead to other chronic diseases (or non-AIDS related diseases and infections). A new paradigm has therefore emerged: there is ongoing morbidity from HIV over the course of HIV infection and accordingly new morbidities are being unmasked because people are living longer with higher CD4 counts.

In people with low CD4 counts, the major cause of death is still occurring due to the established AIDS defining events. But in patients with higher CD4 counts, the impact of non-AIDS events is more pronounced as causes of mortality. As patients do better on treatment, healthcare providers need to be cognizant of this observation and to more diligently focus on the prevention, detection and management of other non-AIDS related complications. The fact that AIDS-related mortality has dropped is good news, but there is little focus on evaluating other diseases and risk factors. There are many opportunities for clinicians to do much more by paying attention to non-AIDS related events. Mortality in HIV-infected individuals is still higher than in the general population. In order to reach the goal of making survival similar among HIV and non-HIV individuals, this will mean paying attention to decreasing risk factors for such condition, monitor non-AIDS related complications more carefully, and securing appropriate management for such conditions, if they occur.

HIV-Related Complications over Time

There have been three distinct phases of non-AIDS related complications since the early 1980s. First, 1981-1996 included monotherapy treatment, and was marked by AIDS related opportunistic infections and malignancies that were linked to low CD4 cell count. Second, from 1996-2006 with the rapid-scale of up HAART, AIDS-related opportunistic infections declined. Instead, there were emerging metabolic complications, such as lipodystrophy and cardiovascular disease. These new events were linked to ARTs, specifically protease inhibitors. Lastly, since 2006 opportunistic infection rates continue to stay low with increased access to ART, now evident as well in lower and middle income countries. Non-AIDS events continue to emerge, though the role of HIV, host factors, and ART still remain uncertain. This spectrum of HIV complications is quite varied, and some are treatable, manageable and preventable especially if we are able to decrease risk factors. The challenge in diagnosis and management of HIV complications remains, particularly in low income areas where lab diagnosis, radiographic procedures, and preventative and therapeutic measures may not be widely available and accessible.

Conclusions

There has been remarkable progress accomplished with the expansion of HIV care and treatment, resulting in a critically important drop in AIDS-related morbidity and mortality. We need to stress that for individuals who are eligible for ART, the benefits of ART clearly outweigh the risks. Practitioners must remain focused on selecting appropriate antiretroviral therapies for long-term treatment. In many low-
resource areas this does not include protease inhibitors, yet when patients must start on PI the newer drugs appear better than older ones.

It is also vital for providers to recognize and diagnose “new” complications of HIV and ART, such as metabolic disorders and other end-organ disorders. Early diagnosis and careful attention to risk mitigation and appropriate treatment is key!

Provider must also recognize the relative significance of non-AIDS related complications amongst individuals with higher CD4 counts and those on ART. The pathogenesis of non-AIDS related complications is multifactorial, but the new framework of HIV-associated immune activation is an important one.

There remains an urgent need for assessment of prevalence and impact of non-AIDS-related complications in PLWH in resource-limited settings, and for their appropriate management. Prevention will save money and lives, and appropriate management of these complications will impact morbidity and mortality. By paying attention to these complications we can truly improve the quality of life for these patients.

Discussion and Questions

Following the presentation by Professor El-Sadr, the conference participants were given time to ask questions and pose comments to the panel. The following questions and answers were discussed.

1. What can we understand from the SMART study about non-AIDS related events and continuous vs. intermittent treatment?

   The take-home message from the SMART study is that anyone who is started on ART should be on continuous treatment. Interruption of treatment is not recommended.
2. We do not understand much about non-AIDS related complications, one of which is HIV-related renal disease. In the US this is a condition that is relevant to the African-American community, and when looked for these genes in Ethiopians in Israel they were not present. Therefore, when researching non-AIDS related complications there are lots of issues to be considered.

There is the need for more research in this area, so that we have more information to inform our actions in the future. There is a study in Uganda that looked at renal insufficiency and HIV – and it was quite common to see this relationship. With ART, renal function improved. Renal disease is one of the diseases in which ART can reduce incidence. Therefore, your point sheds light on the need for continued research on HIV-related renal disease, as well as other non-AIDS related complications.

3. Do Hepatitis B and Hepatitis C seem to be related to HIV?

Depending on the population, hepatitis B and C can be related to HIV. The injection drug using population is at higher risk of hepatitis C as well as HIV. In addition, there have been several studies that have tried to show whether HIV itself is causing liver disease, irrespective of other hepatitis viruses, but this is hard to document. Most evidence shows that this might be related to the drugs, either ARTs or others.
Adama Hospital Proof of Concept Study: Adapting HIV Systems for Diabetes Care - Dr. Zenebe Melaku, ICAP - Ethiopia

This presentation included a brief overview of the Adama Hospital Proof of Concept Study: Adapting HIV Systems for Diabetes Care, including the study hypothesis and background, outcomes and preliminary data, as well as challenges and opportunities.

**HIV/AIDS and Diabetes Study: Hypothesis and Background**

The study hypothesis was that the tools, systems, and strategies developed to provide continuity care for HIV/AIDS can be rapidly and efficiently adapted to support diabetes services. With funding from the Rockefeller Foundation, ICAP engaged stakeholders (such as the FMOH, the Ethiopian Diabetes Association, the Oromiya Regional Health Bureau, and diabetes patients) and engaged in an ethical review (including Columbia University IRB approval and Ethiopian ethical approvals).

This project was intended as a pilot, proof-of-concept study, and was designed as a single time series at one hospital. ICAP conducted a baseline assessment, implemented an intervention package, and engaged in a six-month follow up. More specifically, baseline and follow-up assessments included chart review of adult diabetic patients receiving services at Adama Hospital OPD. Only “active” patients were included (e.g., patients who had visited Adama Hospital within the past 3 months). At baseline, the charts of 260 patients were reviewed; 261 charts were reviewed at follow up six months later.
**Intervention Package**

The intervention package included the provision of on-site training for doctors and nurses on DM care and treatment, in partnership with EDA. ICAP clinical advisors then provided ongoing clinical mentoring and supportive supervision to the Adama Hospital OPD teams providing diabetes care.

ICAP ensured an “essential package” of clinical diagnostic equipment such as an ophthalmoscope, blood pressure cuff, scale, reflex hammer, etc. We also adapted our existing provider support and client education materials for use in a diabetes setting, and adapted charting and HMIS tools, such as intake and follow-up forms. An appointment system was introduced within the outpatient department, and we engaged in simple, standardized data collection and M&E with ongoing feedback to clinicians.

Multidisciplinary team meetings were held to address gaps and take necessary steps to improve diabetes care and treatment. Modeled after HIV/AIDS care and treatment systems, ICAP introduced family-focused care, including a diabetes family enrollment form that lists risk factors for diabetes and outlines eligibility criteria for screening; this was included in every chart.

The intervention package also included the development of a diabetes peer educator curriculum and the engagement of volunteer diabetes peer educators. The peer educators were provided with training and logistical support, but not with stipends, given the very short timeframe of the project and concerns about sustainability.

No new or experimental services were introduced during the study; all clinical protocols were consistent with local and regional guidelines. No new clinic was created; patients were seen within the outpatient department, although routine follow-up appointments were scheduled for a fixed day (Thursday). Lastly, no additional support for medications, labs, or transportation was provided, and no new staff was engaged for implementation; services were provided by existing Adama Hospital clinicians supported by existing ICAP-Ethiopia clinical advisors.

**Outcomes and Preliminary Data**

During the six months of the study, there was an average of 230 visits per month for DM services at Adama hospital (range 190 – 287 visits). The median patient age was 47 years (range 18-83 years), 51% of the cohort were male and 49% were female. Sixty percent of patients had Type 2 Diabetes, and 37% had Type 1 Diabetes. 57% of patients were taking insulin. Patients had been diagnosed with DM for a median of 3 years (range 1-23 years), and had been followed at Adama hospital for a median of 2 years (range 0-22 years).

The baseline chart review explored whether specific services were ever documented, and whether they had been documented during the three most recent visits. Prior to the intervention, blood pressure had been documented at least once in 85% of patients, but only 1% had a documented weight, none had a documented body mass index (BM), and only 10% had ever had a documented foot examination.
When looking at the three most recent visits, only 45% of charts included documentation of blood pressure, only 3% included neurologic and foot exams, and only 1% included a documented fundoscopic examination.

After the six-month intervention, the follow-up chart review revealed a significant improvement in documentation of services at follow-up versus at baseline (including foot exam, measuring BMI, weight, etc., next appointment date documented, DM education provided, medication adherence assessed).

Table 2: Documentation of key services before and after the intervention

<table>
<thead>
<tr>
<th>Were the following ever documented?</th>
<th>Yes, at baseline</th>
<th>Yes, at follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundoscopic exam</td>
<td>21%</td>
<td>50%</td>
</tr>
<tr>
<td>Foot exam</td>
<td>10%</td>
<td>81%</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>85%</td>
<td>80%</td>
</tr>
<tr>
<td>Monofilament exam</td>
<td>5%</td>
<td>62%</td>
</tr>
<tr>
<td>Cigarette use</td>
<td>0%</td>
<td>79%</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0%</td>
<td>54%</td>
</tr>
<tr>
<td>Weight</td>
<td>1%</td>
<td>82%</td>
</tr>
<tr>
<td>BMI</td>
<td>0%</td>
<td>83%</td>
</tr>
<tr>
<td>Medication adherence</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Family members with DM</td>
<td>1%</td>
<td>61%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Were the following documented at any of the most recent three visits?</th>
<th>Yes, at baseline</th>
<th>Yes, at follow up</th>
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<tbody>
<tr>
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<td>45%</td>
<td>80%</td>
</tr>
<tr>
<td>Fundoscopic exam</td>
<td>1%</td>
<td>50%</td>
</tr>
<tr>
<td>Foot exam</td>
<td>3%</td>
<td>81%</td>
</tr>
<tr>
<td>Neurologic exam</td>
<td>3%</td>
<td>56%</td>
</tr>
<tr>
<td>Oral/dental exam</td>
<td>6%</td>
<td>82%</td>
</tr>
<tr>
<td>Assessment of visual acuity</td>
<td>4%</td>
<td>49%</td>
</tr>
<tr>
<td>Assessment of injection site</td>
<td>2%</td>
<td>65%</td>
</tr>
<tr>
<td>Weight</td>
<td>2%</td>
<td>82%</td>
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</table>
In addition to these services, point-of-service testing for family members of diabetic patients was put into effect. Two of the first twenty family members tested were found to have elevated FBG and were linked to further testing and care. Additionally, this study helped to improve patient outcomes on QA/standard of care assessments.

**Lessons Learned and Opportunities: Key Outcomes**

Although these data are preliminary, they are very encouraging. There was a marked increase in documented service delivery with no added staff, and rapid improvements in standards of care. Secondly, staff effectively launched a volunteer DM peer educator program, and added point-of-service testing for family members. Hospital physicians and leadership remarked that this was an “eye opening” experience for them. There are many opportunities to extend and deepen this project if funding becomes available. The study was designed to assess process indicators/outputs only, not clinical or laboratory outcomes and formal costing studies have not yet been performed.

In sum, this short “proof of concept” study illustrates the potential to rapidly improve the quality of care and treatment for diabetes by adapting HIV-specific tools and approaches in use at the same facility. Therefore, we infer that these results could apply similarly to other NCDs and chronic conditions.

Future opportunities and potential are vast. First, ICAP and its partners could build on this experience to launch a center of excellence or model network utilizing the tools and approaches developed to address HIV services to enhance NCD services. In addition, analyses could be extended to include outcomes (adherence, clinical and laboratory status) and a formal costing exercise.
Discussion and Questions

Following Dr. Zenebe’s presentation, participants were given the opportunity to pose relevant questions or discussion points to the speaker.

1. What additional burden does this diabetes program bring to healthcare workers?

The project did not add any new patients, of course, but you are right that health workers in similar situations might be concerned that added protocols and procedures will be burdensome or time consuming. For this study, it was very helpful to be able to show the Adama OPD staff that the new forms and checklists were already in use at the ART clinic, and to have the ART clinic staff encourage them to adopt the new approaches. At the beginning, the new systems did take a little more time, but with training and a little experience, the healthcare workers got quite used to the approach. And, from day 1, they agreed that the new tools helped them document services and improve patient care.

2. All this was done using existing health systems, but do you think that the current MOH budget will be able to support these expanded services?

At this point, we have not had time to formally research the added cost of this intervention. As you point out, this study did not pay for any infrastructure, or staff, or medications, which are usually the most expensive programmatic interventions. However, there are a few things which have minimal costs but bring high values in this study. For example, the introduction of the follow-up and intake forms cost very little and had enormous impact. But, if we want to expand the program nationally, we need to think more critically about the cost issue.

There is another point to consider about cost. At present, diabetic patients are paying out-of-pocket for their health services. But, as our baseline survey demonstrated, they were not getting good value for
their money. Leveraging the lessons and tools of the HIV program in the very same health facility is an efficient way to improve the services that patients are paying for.

3. Has ICAP tried to assess client satisfaction?

ICAP will collect this information but has not done it yet.
## Working Group Sessions

**Moderator:** Dr. Shibru Berhanu, ICAP – Ethiopia

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<td>Leveraging HIV Program Experience at the National Level</td>
<td>Dr. Nigist Tesfaye, (FMOH) &amp; Dr. Ayele Zewde (ICAP – Eth)</td>
<td>Dr. Abraham Endashaw (FMOH) &amp; Dr. Damtew (ICAP – Eth)</td>
<td>Ms. Rahel Adamu (JHU) &amp; Dr. Tsigereda Gadisa (ICAP-Eth)</td>
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<td>Dr. Shambel Aragaw</td>
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<td>Dr Abubeker Bedri</td>
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<td>Ato Tesfaye Temesgen</td>
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<td>Dr Mekonen Feyesa</td>
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### Working Group 1 – Leveraging HIV Program Experience at the National Level

**Expected Output:** To develop feasible recommendations for the design of national chronic disease programs, informed by lessons learned from Ethiopia’s national HIV/AIDS program.

**Discussion Points:**
1) How might the “public health approach” (or “population health approach”) used by Ethiopia’s HIV/AIDS program be adapted for other chronic diseases?
2) Are there national guidelines and protocols for the diagnosis, care, and treatment of diabetes and other chronic diseases in Ethiopia? If not, why not?
3) Are there national and regional targets for chronic disease services? If not, why not? What are some of the barriers to this approach?

4) Could the “three ones” approach used in HIV programs (one national coordinating body, one set of guidelines, one M&E system) be adapted for other chronic diseases?

5) Are there ways in which the FMOH could leverage the private health sector to expand coverage of chronic disease services?

6) Could the human resources innovations used for HIV (task shifting, new cadres, in service training, others) be used for other chronic diseases?

7) Are there clinical sites or contexts in which the care and treatment of HIV might be successfully integrated with the care and treatment of other chronic diseases?

8) What are some of the priority research questions regarding chronic diseases in Ethiopia?

9) Are there other relevant issues to highlight?

Working Group Outputs/Recommendations:

- Support high level leadership, advocacy, and commitment to NCD programs
- Develop a priority research agenda for chronic disease in Ethiopia (includes epidemiologic data, operations research)
- Develop national guidelines for NCD care and treatment, using the “population health” approach – simplified, standardized algorithms feasible for implementation outside of referral hospitals.
- Consider a unified/integrated approach to monitoring and evaluation of all NCD cohorts. Adapt M&E indicators from HIV programs (e.g., number enrolled, number retained, number lost to follow up, number died) and select a small number of intermediate indicators analogous to CD4 counts (fasting blood sugar for DM, blood pressure for HTN), and quality indicators (BP measurement and foot/eye exams for DM, etc). Do not develop complex and dissimilar M&E systems for each NCD.
- Adapt the systems developed to support adherence and retention – patient education, appointment systems, defaulter tracking, peer educator programs.
- Develop guidelines for decentralized diagnosis – ideally at the community level.
  - NB that South Africa is now combining VCT with screening for DM and HTN.
- Integrate NCD programs with other health initiatives
- Involve key stakeholders
Working Group 2 – Leveraging HIV Program Experience to Support NCD Diagnosis and Enrollment

**Expected Output:** To identify key lessons learned from Ethiopia’s experience with HIV diagnosis (e.g., VCT, PICT) that may inform systems for diagnosis of other chronic diseases (e.g., diabetes, hypertension, and depression) and enrolment of patients in care & treatment programs.

**Discussion Points:**
1) In general, how and when are chronic diseases diagnosed in Ethiopia? Is it currently possible to make these diagnoses at the health center or community levels?
2) What would be required in order to decentralize the diagnoses of chronic diseases? What lessons could be adapted from HIV programs?
3) For example:
   a. What laboratory tests are currently used to diagnose diabetes? Are these in widespread use at the health center level? If not, why not? What could be done to change this?
   b. What diagnostic equipment is currently used to diagnose hypertension? Is this in widespread use at the health center level? If not, why not? What could be done to change this?
   c. How is the diagnosis of unipolar depression currently made? Is this diagnosis often made at the health center level? If not, why not? What could be done to change this?
4) Is there much demand for chronic disease services? When do patients typically present for care and treatment? Are there ways to facilitate early diagnosis and effective enrolment into care and treatment programs?
5) What are some of the priority research questions related to the diagnosis of chronic diseases in Ethiopia?
6) Are there other relevant issues to highlight?

**Working Group Outputs:**

**Recommendations**
- Community level – use health extension workers and other health cadres to help with diagnosis and testing
- Facility level – important to train healthcare workers, especially in identification of high risk patients, job aids, mentorship, screening for selected patients
- Enrollment – implement point of care testing and strengthen referral linkages

**Research questions**
- What is the magnitude of the problem? We do not have sufficient data on this therefore need situational analysis. Epidemiologic data will help to develop facility-level, regional-level, and national-level enrollment targets.
- Need to develop comprehensive screening tool at community and facility level
- Need to validate diagnostic tools that can be used at the health center and community levels. For example, the use of oral glucose tolerance tests to diagnose DM is not an approach that can be scaled up or decentralized. Can an algorithm using fasting blood sugar or HbA1c be tested and validated, as was done in Cameroon?

**Relevant issues**
- Health systems strengthening is key and will help with integrating NCD into other healthcare services.
Laboratory systems are vital – as are simple and clear algorithms and protocols for specimen transport.

**Working Group 3 – Leveraging HIV Program Experience to Support Adherence and Retention in NCD Programs**

**Expected Output:** To identify high-yield interventions to support adherence and retention in chronic disease programs, building upon lessons learned from Ethiopia’s national HIV/AIDS program.

**Discussion Points:**

1) What are some of the key barriers to retention in chronic disease programs – i.e., why do patients become “lost to follow-up”?
2) What are some of the key barriers to adherence in chronic disease programs – i.e., why do patients not take their medications regularly?
3) What are some of the approaches used by HIV programs to support retention in care? (i.e., to assist patients to come to the health facility regularly, and to avoid missing appointments);
4) What are some of the approaches used by HIV programs to support adherence to medications (i.e., to assist patients to take every dose of their medications as scheduled)?
5) What are some of the priority research questions related to adherence and retention in chronic disease programs in Ethiopia?
6) Are there other relevant issues to highlight?

**Working Group Outputs:**

- **Barriers to retention**
  - Patient-related – cost, transport, stigma, social influence, medication side effects
  - System-related – drug supply issues, tracking systems, appointment systems
  - Facility and provider related – distance, lack of coordination at facility level, commitment, work-load

- **Barriers to adherence**
  - Patient-related – lack of information, ‘silent diseases’, misconceptions, stigma, co-morbidities
  - Drug-related – side effects, lack of reminder systems so patients forget, peer support groups, pill burden and fatigue, availability of drugs
  - Provider and facility related - winning patients trust (work overload, lack of motivation)

- **Approaches to support retention in care/HIV programs**
  - Use of appointment systems
  - Decentralize and improve referral linkages
  - Provide ongoing assessment counseling and support
  - Implement task shifting
  - Develop peer support groups and provide more comprehensive services
  - Minimize waiting time

- **Approaches used to support adherence to medication/ HIV programs**
  - Ongoing counseling and education
  - Patient support and educational tools
Identify and counsel on barriers

Research Questions

- What is the extent of adherence to care and treatment in NCD programs?

**Working Group 4 – Leveraging HIV Program Experience to Support Monitoring and Evaluation of NCD Programs**

**Expected Output:** To develop feasible recommendations for monitoring and evaluation of chronic disease programs in Ethiopia, building upon the experience of HIV/AIDS programs.

**Discussion Points:**

1. Are hand-held cards or unstructured health records (e.g., medical charts) sufficient to guide the care and treatment of individuals with chronic diseases? Why or why not?
2. Might some of the HMIS tools (forms/formats, flowsheets, etc) developed for HIV programs be adapted for other chronic diseases? What are some of the advantages and disadvantages of this approach?
3. How do programmatic monitoring and evaluation of chronic diseases differ from M&E of other health conditions? What are some of the key challenges in monitoring such cohorts?
4. What are some of the key programmatic indicators common to all chronic diseases? (For example, the number of individuals newly enrolled per time period).
5. Is it reasonable to develop targets for chronic disease enrolment at the national, regional, and facility levels? Why or why not? What information would be required to support this approach?
6. What are some of the priority research questions related to the monitoring and evaluation of chronic disease programs in Ethiopia?
7. Are there other relevant issues to highlight?

**Working Group Outputs:**

- **Need for structure**
  - Evidence-based structured health records are required for NCDs including standardized care, decision support mechanism,

- **Benefits of structured tools**
  - Care provision per required guideline
  - Monitoring of clinical care
  - Support tracking for better adherence
  - Inform policy with evidence
  - Linking surveillance to routine NCD monitoring
  - Advocacy and fundraising

- **Current status**
  - Current HMIS status vis-à-vis NCDs
    - Family folder started at urban health extension worker level includes NCDs
    - Priority NCDs already integrated into screening tools

- **Recommendations**
  - Develop and integrate NCDs at each level of the healthcare system
  - Review the set of current HIV/AIDS care tools and adapt them for use at NCD outlets
• Challenges
  o Data are incomplete

• Key programmatic indicators
  o Point of care # of patients offered/tested for NCDs
  o Cohort/outcome to be defined as per clinical guideline
  o # new/ever/currently enrolled patients
  o # defaulters tracked

• Priority research questions
  o What is the disease burden according to population, region, age, gender?
  o What are current attitudes and practices towards NCDs? Once this is understood program implementers can move forward and determine program targets.

Figure 13: Rahel Adamu (JHU) taking notes during a working group session
Feedback from Small Groups: Moderators – Dr. Ahmed Reja, EDA & Dr. Miriam Rabkin, ICAP- NY

Dr. Rabkin summarized the group discussions, and highlighted the fact that all groups came up with the same question: what’s next? How can we take what we’ve learned today and use these lessons to help improve the quality of care for patients living with chronic illness? This question was posed to the participants, and their suggestions and feedback are below.

- The idea is to use the Ethiopian experience with HIV programs as a template to help develop strong programs for NCDs. There are currently only two programs doing this, one of which is a MOH task force. We must first document whatever has been said and done today, and provide it to the MOH. Hopefully there will also be a follow-up meeting to see what the task force has done with this input.

- One conference participant noted that as a member of the national task force, it is critical to include the data presented by ICAP to help bridge the gap, and bring these resources from HIV/AIDS to NCDs.

- The FMOH has integrated urban health extension workers into the NCD program. We need to engage all stakeholders in this process, including health workers as they are at the forefront of this work. We need to be proactive and complement each other in order to avoid unnecessary duplication of efforts, and to bridge the gaps! NCDs should be everybody’s business.

- We need to work on having an evidence-based approach, and need to get more data.

- The next step has already been identified – which is to bring the national strategy framework forward. We need to continue working with ICAP and other partners, as indicated in the framework, to continue bringing NCDs to the forefront of national health policies and programs. We should look at care and treatment of patients with NCDs in a broader context, disseminate this framework widely, and further develop it if needed.

- The next step is to produce a program for each of the four identified chronic diseases, and involve stakeholders in this process.
Closing Remarks

Closing Remarks - Professor Wafaa El-Sadr, ICAP-NY

This has been a wonderful meeting and a very rich discussion. First, the sense of momentum is palpable, and the sense that this is a moment in time which can dramatically change the NCD approach and landscape is real and very exciting. There is an effort to move from a framework and strategy and shift towards action through concrete activities. Everyone in this room is really looking for action and outcomes. Many participants mentioned that this was an “eye-opening” experience – and all of these examples today represent an approach to adapt an HIV program and apply to other chronic diseases. All of these small examples are really powerful in guiding the path forward.

Another interesting area is the voices of the providers - not only in transforming the work environment, but also in their power to inform policies, advocate for change, and improve quality of care. The role of advocacy is quite powerful here as well, similar to the advocacy movement for HIV/AIDS. For example, the cost of medications, testing and diagnostic for NCDs is quite high, and we can learn from the advocacy efforts from the HIV epidemic which were instrumental in lowering diagnostic and medication costs. Advocacy is not only specific to one country, but also should be brought to the global level. For many NCDs there are important lifestyle changes, many of which are not easy to create, and require tremendous work by advocacy groups, media, and individuals to change behaviors. The power of evidence and the power of data is really important, as this can help inform program development, and achievement of high quality programs.

Today focused on “bridging the divide”. The question still remains, what’s next? How can we keep this momentum? It is incumbent on all of us to do any piece that we can, to maintain this energy, and take on the responsibility to achieve these important goals.
## Appendix A: Participant List

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<tr>
<th>Name</th>
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<tbody>
<tr>
<td>Dr. Keseteberhan Admassu</td>
<td>State Minister</td>
<td>Federal Ministry of Health</td>
</tr>
<tr>
<td>Dr. Ahmed Reja</td>
<td>President</td>
<td>Ethiopian Diabetes Association</td>
</tr>
<tr>
<td>Professor Wafaas El-Sadr</td>
<td>Director</td>
<td>ICAP Columbia University</td>
</tr>
<tr>
<td>Dr. Zenebe Melaku</td>
<td>Country Director</td>
<td>ICAP-Ethiopia</td>
</tr>
<tr>
<td>Dr. Miriam Rabkin</td>
<td>Director, HS Strategies</td>
<td>ICAP-NY</td>
</tr>
<tr>
<td>Aklilu Retta</td>
<td>Coordinator</td>
<td>Ethiopian Heart Association</td>
</tr>
<tr>
<td>Marta Kebede</td>
<td>HIV/AIDS Coordinator</td>
<td>Harari Regional Health Bureau</td>
</tr>
<tr>
<td>Idris Mohammed</td>
<td>HIV/AIDS Coordinator</td>
<td>Somali Regional Health Bureau</td>
</tr>
<tr>
<td>Reffisa Bekele</td>
<td>ART Coordinator</td>
<td>Oromiya Regional Health Bureau</td>
</tr>
<tr>
<td>Dr. Getnet Abera</td>
<td>ART Coordinator</td>
<td>Dire Dawa Regional Health Bureau</td>
</tr>
<tr>
<td>Dr. Abubakir Bedri</td>
<td>C&amp;T Advisor</td>
<td>CDC Ethiopia</td>
</tr>
<tr>
<td>Dr. Ayele Zewde</td>
<td>Director of CSD</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Tsigereda Gadisa</td>
<td>M&amp;E Director</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Bereket H/Giorgis</td>
<td>PMI Director</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Altaye H/Giorgis</td>
<td>Technical Director</td>
<td>FHI</td>
</tr>
<tr>
<td>Tsedey Bezabeh</td>
<td>TUTAPE</td>
<td>Tulane University</td>
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<tr>
<td>Dr. Henok Elias</td>
<td>PMTCT/ pediatric advisor</td>
<td>ICAP-E</td>
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<tr>
<td>Assefa A menu</td>
<td>Program Coordinator</td>
<td>CARE</td>
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<td>Mulunesh Mamo</td>
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<td>Radio Fana</td>
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<tr>
<td>Samuel H/Mariam</td>
<td>Program Advisor</td>
<td>University of California at San Diego (UCSD)</td>
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<tr>
<td>Kifleyacob G/meskel</td>
<td>Finance &amp; Admin. Director</td>
<td>ICAP-E</td>
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<tr>
<td>Misirak Tarekegn</td>
<td>Program Manager</td>
<td>Ethiopian Diabetes Association</td>
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<tr>
<td>Professor Kebede Oli</td>
<td></td>
<td>Addis Ababa University &amp; Landmark H</td>
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<tr>
<td>Dr. Fikru Tesfaye</td>
<td>Member of National NCD Task Force</td>
<td>Addis Ababa University Medical Faculty</td>
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<tr>
<td>Tsedey Alemseged</td>
<td>Coordinator, CSD</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Leulesaged Yohanes</td>
<td>Program Advisor</td>
<td>Federal Ministry of Health</td>
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<tr>
<td>Dr. Wubaye Walelign</td>
<td>TB/PC Advisor</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Tsegaye Awano</td>
<td>Pediatric- PMTCT Advisor</td>
<td>ICAP-E</td>
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<td>Sr. Yewubdar Mandefro</td>
<td>M to M Coordinator</td>
<td>ICAP-E</td>
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<td>Dr. Delayehu Bekele</td>
<td>SMH/PMTCT Advisor</td>
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<td>Dr. Lulu Endale</td>
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<tr>
<td>Wzo Gobane Dea</td>
<td>Officer</td>
<td>Federal Ministry of Health</td>
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<tr>
<td>Dr. Alemayehu Admasu</td>
<td>Regional Director</td>
<td>ICAP-E</td>
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<tr>
<td>Dr. Yonathan Tadesse</td>
<td>Regional Director</td>
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<td>Dr. Zerihun Hika</td>
<td>Program Officer</td>
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<tr>
<td>Wossen Nega</td>
<td>Regional Lab Adv.</td>
<td>ICAP-E</td>
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<td>41</td>
<td>Dr. Ashenafi Negash</td>
<td>Associate Director of Programs</td>
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<td>Rahel Admasu</td>
<td>Director</td>
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<td>Tekilu Armde</td>
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<td>Tesfaye Mengesha</td>
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<td>61</td>
<td>Dr. Shambel Aragaw</td>
<td>Regional Director</td>
</tr>
<tr>
<td>62</td>
<td>Dr. Amsalu Bekele</td>
<td>Member of National NCD Task Force</td>
</tr>
<tr>
<td>63</td>
<td>Dr. Yewondwosen Tadese</td>
<td>Consultant Nephrologist</td>
</tr>
<tr>
<td>64</td>
<td>Sossena Belayneh</td>
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<tr>
<td>65</td>
<td>Ms. Naomi Sugar</td>
<td></td>
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<td>66</td>
<td>Woinshet Kerebih</td>
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<tr>
<td>67</td>
<td>Habtamu Milkias</td>
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<td>68</td>
<td>Dr. Chuhu Girma</td>
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<td>69</td>
<td>Abebe Bekele</td>
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<td>70</td>
<td>Tsegah Haimanot</td>
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<td>71</td>
<td>Anuar Fikisa</td>
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<tr>
<td>72</td>
<td>Dr. Shibru Berhanu</td>
<td>Assoc. Director of Clinical Services</td>
</tr>
</tbody>
</table>
National Strategy on Chronic Non Communicable Diseases

Federal Ministry of Health, Ethiopia
Dec. 2010

Outline of the Presentation

• Background on NCD
• Risk factors for NCD
• Rationale for NCD strategy
• Key components of strategy
• Challenges
• Way forward

Background

• Chronic diseases, such as heart disease, stroke, cancers, chronic respiratory diseases and diabetes, are by far the leading cause of mortality in the world, representing 60% of all deaths.
• Chronic Non Communicable Diseases were assumed to be the matter of the affluent society. But, now days it has become also the problem of the developing countries due to the shift in life style.
Background cont...

- Contrary to common perception, 80% of chronic disease deaths occur in low and middle-income countries, where chronic diseases affect younger populations and lead to premature mortality due to lack of prevention or effective management of the diseases or their risk factors.
- The growing burden of chronic non-communicable diseases is gaining increasing attention worldwide, including Africa.

Background cont...

- In the African region, NCDs are projected to account for more than a quarter of all deaths by 2015.
- It is estimated that the rate of increase of deaths from chronic diseases in the region will exceed that from infectious diseases, maternal and perinatal conditions, and nutritional deficiencies more than four-fold in the next 10 years.

Background cont...

- There was nationally conducted situational analysis on NCD in 2008 by FMOH and other important stakeholders.
- The study finding revealed that Diabetes Mellitus, Cancer, Cardiovascular, Renal and Chronic obstructive pulmonary Diseases are amongst those with high burden.
Background cont...

- Maternal and Child health, Communicable diseases like TB and HIV/AIDS, Malaria were among the diseases of priority in the third HSDP.

- In the fourth HSDP, NCD has been taken as one area of interventions in the health sector.

- The FMOH has a task force from different relevant partners and the ministry itself which regularly meets on key agendas.

Background cont...

- NCD Guidelines for urban health extension workers have been prepared in collaboration with different stakeholders.

- The guidelines will help the UHEWs to early identify cases and to send to health facilities for Dx and MX. In addition to create awareness on the risk factors associated with it.

Risk factors

- High intake of cholesterol and other energy rich diets
- Inadequate intake of fruits and vegetables,
- Overweight or obesity
- Physical inactivity
- Alcoholic ingestion
- Tobacco use.
Rationale of the NCD strategy

- To have shared commitment and consensus on the strategic direction to control and prevent NCD and its risk factors
- It provides framework for effective and efficient coordination of activities and resource mobilization

Key components of the strategy

1. Strengthening institutional capacity in the leadership and management of programs for the prevention and control of chronic diseases
   - Capacity building on programme management through training, undertaking M&E
   - Integration with other programmes. So that, clients will be beneficial

2. Advocacy, Communication and Social mobilization
   - Community members- awareness creation on risk factors, benefit of early diagnosis and treatment through community conversations and other means
   - Policy makers and programme managers – to ensure gov. commitment at all level

3. Information, education and communication/behavioral change communication (IEC/BCC)
   - Strengthening media communication
   - Print advocacy

4. Integrating the prevention and control of chronic diseases with the health extension program
   - Include in the family folder
5. Strengthening the diagnostic and clinical management capability of the health system in chronic disease care
   ➢ Trainings of health professionals
   ➢ equipping with the necessary diagnostic and treatment facilities

6. Epidemiological surveillance, research, monitoring and evaluation
   ➢ To know progress towards achieving goal
   ➢ To know the trend and pattern of diseases

7. Strengthening the health management information system (HMIS)
   ➢ To address NCDs in complete, accurate and reliable manner

8. Enhancing the training of health professionals on chronic diseases
   ➢ In service and pre service trainings

9. Promoting public-private partnership
   ➢ To have multi sectoral collaboration and ownership
   ➢ To harmonize and coordinate efforts
Key components of the strategy cont...

10. Formulating and enforcing legislations
   - Conducive environment for physical activities and other health promoting activities
   - Enforce labeling of health hazards of cigarettes and other addictive substances in local language.
   - Impose taxation on imported foods and drinks with potential health hazards, (added salt, sweeteners or refined carbohydrates)

Guiding protocol for HEWs on chronic non-communicable diseases and mental health

- This material will help HEWs in early identification of cases, creation of health awareness on major NCDs through education on risk factors, sign and symptoms of diseases, benefit of early diagnosis and treatment

Challenges

- Few partners working on NCD – budget implication
- Lack of adequate evidence on NCD
Way forward - Programme development

- For selected high impact priority diseases:
  - DM, Cancer, COPD, CVD, Renal Diseases

- Resource mobilization started:
  - MOH, WHO, Partners and other stakeholders

Way forward - Programme development cont...

- The programme will clearly show what has to be done at all levels. At the community level (awareness creation and early screening), at Woreda, Zonal and Regional level (strengthening the programme); at university level (curriculum development)

Way forward - Programme development cont...

- Move on creation of NCD consortium by volunteer associations

- This will help for effective and efficient coordination of activities. For example: ACSM and maximize resource mobilization.
-Way forward -
Programme development cont...

- Strengthening the Technical Working Group: by inviting partners and other important stakeholders to help mobilize resources and efficiently harmonize activities.
- Currently WHO, AAU- MF, School of Public health AAU, Mathios wondu YE-Ethiopia cancer society, Ethiopia Diabetes association, Ethiopia Kidney association, private/interested individuals and FMOH are active members.

Thank you for listening
Strengthening Chronic Disease Services in Ethiopia: Lessons from HIV/AIDS Program Implementation

3 December 2010
Addis Ababa

Systems for Chronic Disease Care in Ethiopia

Dr. Ahmed Reja
President, Ethiopian Diabetes Association

Acknowledgement

• Prof. Sileshi Luelseged – ICAP NY
• Dr. Zenebe Melaku – ICAP Ethiopia
• Dr. Miriam Rabkin – ICAP NY

Systems for Chronic Disease Care in Ethiopia

Agenda:
1. Health systems and chronic disease
2. NCD systems in Ethiopia – overview
3. NCD systems in Ethiopia – data from ICAP situational analysis
4. Challenges, opportunities, and next steps
5. Main Points
“Cancer, diabetes, and heart diseases are no longer the diseases of the Wealthy. Today they hamper the people and the economies of the poorest populations even more than infectious diseases. This represents a public health emergency in slow motion.”

Ban Ki-Moon, UN Secretary-General, 2009

1. Health Systems and Chronic Disease

Chronic disease care requires:

• Decentralized, widely accessible diagnostic testing
• Psychosocial and practical support for enrollment, adherence, and retention
• Robust referral and linkage systems
• HMIS that support continuity care
• Uninterrupted supplies of medications and laboratory diagnostics
• Trained and supervised multidisciplinary teams
• M&E systems appropriate for cohorts

2. NCD Systems in Ethiopia - Overview

• Strategic Framework for Prevention & Control of NCDs is finalized
• No program aimed at the prevention and control of the main NCDs
• No organizational unit to coordinate activities of prevention and management of NCDs
• Management – routine health care provision
• Pre-service or in-service training programs for NCDs are inadequate
2. NCD Systems in Ethiopia - Overview

- Gross shortage of health professionals
- Lack of diagnostic and therapeutic equipment
- Lack of standardized protocols or clinical guidelines
- No System of Monitoring & Evaluation of Performance

Conclusion:
No organized or coordinated activities aimed at the prevention and control or clinical management of chronic diseases at the public or private health system in the country.

Are Chronic Diseases Risk Factors Prevalent in Ethiopians?
Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic
Fikru Tesfaye, Peter Byass and Stig Wall

Published 23 August 2009
BMC Cardiovascular Disorders 2009, 9:39

## Results

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Males</td>
</tr>
<tr>
<td>Overweight</td>
<td>20</td>
</tr>
<tr>
<td>Obese</td>
<td>2</td>
</tr>
<tr>
<td>Low level of Total Physical Activity</td>
<td>17</td>
</tr>
<tr>
<td>High BP (&gt; 140/90 mmHg)</td>
<td>32</td>
</tr>
</tbody>
</table>

## Reasons for Explosive Rise in NCDs
- Aging Populations
- Epidemiological Transition
- Obesity
- Harmful Lifestyles
  - Physical Inactivity
  - Unhealthy Diet
  - Smoking
  - Alcohol Abuse
- Harmful Environments
  - Unplanned Urbanization & Globalization
  - Rapid & Unregulated Economic Transformation
Growing Burden of NCDs Will Negatively Impact Progress Towards the MDGs

LET US NOT LET NCDs UNDERMINE THE MILLENNIUM DEVELOPMENT GOALS

3. NCD Systems – ICAP Situational Analysis

- ICAP situational analysis = structured site survey conducted in November 2010
- Convenience sample of 33 hospitals, surveyed using a short standardized tool
- Three conditions were selected to explore chronic disease services: diabetes, hypertension, and epilepsy

33 hospitals surveyed (31 public, 2 faith-based, none in Addis Ababa):

<table>
<thead>
<tr>
<th>Condition</th>
<th>Median # of Patients Enrolled</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>175 (range: 9 - 1,944)</td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td>197 (range: 14 - 1,935)</td>
<td></td>
</tr>
<tr>
<td>Epilepsy</td>
<td>89 (range: 5 - 1,691)</td>
<td></td>
</tr>
</tbody>
</table>

Appendix B
3. NCD Systems – ICAP Situational Analysis

- Few hospitals have designated clinics for NCDs; most see NCD patients on an ad hoc basis along with other OPD patients
- 27% of facilities have a designated DM clinic (usually an assigned day in which patients came to OPD)
- 21% of facilities have a designated HTN clinic (usually an assigned day in which patients came to OPD)
- 21% have a designated epilepsy clinic (often within the psychiatric clinic)

Appointment systems for DM, HTN, epilepsy:
- “Patient follow up is irregular and there is no proper data capturing and reporting system.”
- “No one knows when patients miss their appointments.”
- “There is no way to know if a patient misses an appointment...the staff only see the cards of patients who have come to clinic.”
- “When patients appear for follow-up their cards are taken from the HMIS room to the OPD...”
- “No one follows patient appointments or knows when they are missed.”
- “There is no separate register for these patients.”
3. NCD Systems – ICAP Situational Analysis

- Very few (3%) of hospitals have provider support tools (wall charts, pocket guides, table-top guides, etc) for NCD services
- Very few (3%) of hospitals have SOPs for DM, HTN, and/or epilepsy; each provider acts independently
- Very few (3%) of hospitals have charting tools or forms to support continuity care for DM, HTN, and/or epilepsy (e.g., flow sheets, standard formats, checklists)
- Very few (3%) of hospitals have any M&E systems for chronic diseases

Access to equipment, medications, and laboratory diagnostics is variable...but rarely affordable

Access to medications and diagnostics:
- “Medications are available to purchase, but there is always a shortage of free drugs for those who cannot afford to pay.”
- “There is a frequent shortage of all medications for those who cannot afford to buy them.”
- “There is a shortage of insulin and OHA for ‘free’ patients.”
3. NCD Systems – ICAP Situational Analysis

- Patient education materials are rare or nonexistent
  - 3% for DM
  - 0% for HTN
  - 0% for epilepsy

4. Challenges, Opportunities, and Next Steps

**Challenges**

- No Formal Organized NCDs Health Care Delivery
- Increasing NCDs Healthcare Needs
- Inadequate Training of Health Professional
- Unavailability of Diagnostic Equipment
- Competing Priorities
- Poor Access to Healthcare
- Illiteracy

**Challenges**

- Cultural Beliefs
- Inadequate Education Delivery
- Intermittent Training Programs for Health Professionals
- Poor Patient Attendance
- Short Consultation Time
Opportunities

- Growth and Transformation Plan of the Ethiopian government
- Inclusion of NCDs in HSDP IV
- Committed MOH, NGOs, Associations & NCD Consortium
- Upcoming UN Summit September 2011

Next Steps

- Studies on Magnitude of NCDs
- Create/Strength & Integrate NCDs Clinics
- Devolution of Chronic Care along with CPDs
- Standardize Clinical Care
  – Uniform guidelines or protocols
  – Appropriate Record System
  – Well Designed Educational Program
- Improve Diagnostic & Therapeutic Facilities

Next Steps

- Design & Implement Workable Referral & Networking System
- Increase Public Awareness on NCDs
- Design & Implement Community based Interventions
- Foster Public-Private Partnership
- Increase Role of Associations of Patients/Professionals
- Learn from HIV, TB, MCH Programs
### The Ethiopian Diabetes Association

**EDA History**

- Established in January 1984
- Registered under Ethiopian Ministry of Justice as a non-governmental organization
- Has over 10,000 members throughout the country
- Has 32 branch offices in different regions

### Ethiopian Diabetes Association

- Member of IDF – Global & Africa Region
- Quite Active Particularly in Patient Education
- Public Awareness of Diabetes in Major Cities is Increasing
- Advocacy Role
- Works Closely with MOH, IDF, WDF, ICAP, etc
- Engaged in Capacity Building
Establishing and strengthening branch offices (32 branch offices)

Support to Patients
- Free Blood Glucose test at the office
- Free insulin distribution (Life for a Child Program)
- Distribution of some glucose meters to very needy patients
- Free Digital Camera Screening for Diabetic Retinopathy (in collaboration with Birmingham group & WDF)
- Training on Clinical Practice Guideline & Diabetes Education Manual

Main Points
- Focus on NCDs has been minimal
- Partnership & collaboration of all stakeholders is vital to prevent NCDs
- Need to focus on Health Systems holistically
- Need to focus on locally appropriate interventions
- Better future for NCDs prevention & care
- NCDs can be prevented and treated successfully with a relatively small investment
- Need to learn from experience in HIV/TB/MCH programs
Thank you
Leveraging HIV Scale-up for Chronic Disease Services

Miriam Rabkin, MD, MPH
ICAP Director for Health Systems Strategies
Associate Professor of Medicine & Epidemiology
Columbia University Mailman School of Public Health

Making the HIV-NCD connection

- Unifying characteristics of chronic diseases
- Learning from success: how have HIV programs implemented effective continuity care in resource-limited settings?
- Leveraging HIV programs to strengthen chronic disease services: three suggestions

Defining our terms:
“Chronic disease” vs. “non-communicable disease”

- There are several different/complimentary conceptual frameworks and definitions for “NCDs”
- Today’s presentation will focus on enabling health systems to provide secondary prevention, care, and treatment for adults and children who already have the chronic conditions in question
- This is not to suggest that more ‘upstream’ interventions are less important, or that they have nothing to learn from HIV programs
What is a “chronic disease”?

**Generally:**
- Long duration
  - Requires self-management and life-long adherence
- Slow progression
  - Early engagement in care is key
- Often preventable
  - Primary vs. secondary prevention
- Risk factors may cluster in families/households
  - Genetic and/or environmental
- Asymptomatic or symptoms wax and wane

Characteristics/priorities of chronic disease from the individual’s perspective:

- Interacting with the health care system on a regular basis over time and for life
- Incorporating responsibility for managing health and self-care into daily behavior
- Sustaining healthy behaviors (adherence, nutrition, smoking cessation, etc)
- Accessing psychosocial support services to assist with the emotional and social impact of chronic illness

Characteristics/priorities of chronic disease from the health system’s perspective:

<table>
<thead>
<tr>
<th>Diagnosis and enrollment</th>
<th>Identification of risk factors, early diagnosis, opportunistic care-finding, point-of-service diagnostics, standardized diagnostic protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention and adherence</td>
<td>Appointment systems, defaulter tracking, patient counseling, expert patients, secure medication supply chains, pharmacy support</td>
</tr>
<tr>
<td>Multidisciplinary family-focused care</td>
<td>A multidisciplinary team of healthcare providers and community members delivers care in partnership with the patient</td>
</tr>
<tr>
<td>Longitudinal monitoring</td>
<td>Health information systems have standardized and easily retrievable data</td>
</tr>
<tr>
<td>Linkages and referrals</td>
<td>Links within the health facility (to lab, pharmacy, others), between facilities, and between facility &amp; community</td>
</tr>
<tr>
<td>Self management</td>
<td>An informed, motivated patient is an effective manager of his/her own health</td>
</tr>
<tr>
<td>Community linkages and partnerships</td>
<td>Need functional partnerships between health facility-based providers and community-based groups that facilitate access to services across the care continuum</td>
</tr>
</tbody>
</table>
“Bridging the Divide”

- The distinction between non-communicable chronic diseases and communicable chronic diseases is an historic and administrative one
- May not always be helpful when developing continuity care programs
- HIV/AIDS programs are often the only large-scale local model of continuity care…but can be overlooked by NCD program developers

Making the HIV-NCD connection

- Unifying characteristics of chronic diseases
- Learning from success: how have HIV programs implemented effective continuity care in resource-limited settings?
- Leveraging HIV programs to strengthen chronic disease services: three suggestions

Scaling-up HIV/AIDS services

- Civil society engagement
- Advocacy by and for people living with HIV/AIDS
- Effective activism for access and quality
- Change in mindset: “impossible” to “achievable”
- Highly effective (!) advocacy for financing
Scaling-up HIV/AIDS services

- Simplified standardized protocols for diagnosis, management, monitoring, and referrals
  - Minimal lab testing, reliance on clinical assessment
  - Endorsed by WHO and adapted as national guidelines
  - Point-of-service diagnostics

- Standardized 1st and 2nd line drug regimens
  - Fixed-dose combination pills
  - Generic formulations
  - Strong political pressure on pharmaceutical companies to decrease prices

Scaling-up HIV/AIDS services

- Decentralization of treatment to district level
  - Development of standardized “package of care” including infrastructure, equipment, supplies, drugs, clinical and psychosocial services, medical records, M&E
  - “Doorstep services” – taking services to the home and the community

- Task-shifting from physicians to nurses and other cadres
  - Introduction of new cadres
  - Examination of existing licensure and accreditation rules/laws
    - Nurse-initiated antiretroviral treatment
    - HIV testing by trained laypeople

Scaling-up HIV/AIDS services

- Strengthening of procurement and supply chain management, monitoring of stock-outs and education of patients/communities
- Simplified and standardized monitoring and evaluation protocols
  - The “Three Ones” principles (2004)
    - One HIV/AIDS Action Framework that provides the basis for coordinating the work of all partners
    - One National AIDS Coordinating Authority, with a broad-based multisectoral mandate
    - One country-level Monitoring and Evaluation System
Scaling-up HIV/AIDS services

- Public targets (based on estimated prevalence) at global, national, regional, and facility levels
  - Transparency
  - Accountability
  - Pressure to achieve

In contrast...

- Few, if any, continuity care systems for other chronic diseases exist in most resource-limited settings

ICAP-Swaziland NCD Situational Analysis

Preliminary data from IRB/MOH-approved research:

- 0/15 sites* surveyed had appointment systems for HTN or DM
- 4/15 sites (1 hospital, 1 health center, 2 clinics) had on-site medical records of any kind
- 2/15 sites used any structured charting tool
- 3/15 sites had individuals or teams specifically responsible for DM or HTN program

*3 hospitals, 3 health centers, 9 health clinics
Strengthening Chronic Disease Services: Lessons from HIV/AIDS Program Implementation

Availability of Basic Medical Equipment

Access to On-site Diagnostics
Availability of Key Medications

Documentation

• Chart review of 100 randomly-selected diabetic charts at national hospital diabetes clinic
  – 100% recorded at least one FBG
  – 100% recorded at least one BP measurement
  – 7% documented a foot exam
  – 4% documented lab tests ordered
  – 1% documented a fundoscopic exam
  – 1% documented medications
  – 0% documented smoking status, adherence assessment, diabetes-related complications

Making the HIV-NCD connection

• Unifying characteristics of chronic diseases
• Learning from success: how have HIV programs implemented effective continuity care in resource-limited settings?
• Leveraging HIV programs to strengthen chronic disease services: three suggestions
Leveraging HIV programs:
Three suggestions

1. Take a population health approach to service delivery for chronic diseases
2. Where appropriate, adapt existing systems and tools designed, developed, and piloted within HIV programs
3. Screen and treat PLWHA for NCDs and risk factors as part of comprehensive care and treatment

1. The Population Health Approach

• Consider the “three ones” – one national framework, one national coordinating authority, one national M&E system
• Develop simplified, standardized protocols (not just guidelines) for diagnosis, referral, care, and treatment
• Support a “minimum package” of clinical, laboratory and pharmacy services and equipment
• Use simple powerful programmatic indicators (enrollment, retention, adherence, outcomes)
• Enhance (and evaluate) linkages and referrals
• Decentralize!

2. Adapt existing systems and tools

Illustrative systems:
• Point-of-service diagnostics with ‘real time’ linkages to care
• Adherence support, expert clients
• Appointment systems, defaulter tracking
• Links between clinical, lab, and pharmacy services
• Task-shifting, multidisciplinary teams, decentralization
• Supportive supervision, clinical mentoring
• Use of data at the site level to guide program improvement
• Longitudinal / cohort M&E systems
2. Adapt existing systems and tools

Illustrative tools:
- Appointment logs, referral forms, outreach forms
- On-site medical records with structured charting tools
- Flowsheets, algorithms, SOPs
- Clinical support tools
- M & E systems, databases, training tools
- Pharmacy support tools
- Lab support tools

Leverage existing tools and systems

- In some contexts, integrating or co-locating chronic disease (continuity care) services may be appropriate
  - Ex: Integrated services in Cambodia (MSF)
- In others, HIV programs can be used to “jumpstart” parallel programs for other chronic diseases
  - Ex: Parallel services in Ethiopia (ICAP)

Integrated Services in Cambodia

- MSF supported 3 clinics with co-located services for HIV, diabetes, and CVD
- Adapted treatment and monitoring protocols
  - Standard evidence-based flow charts
  - Use of generic drugs
  - Routine cohort monitoring
- Specific training on patient-centered case management
- Counselors and educators for adherence support
- Largely common patient flow, staff capable to manage different categories of patients.
- Patient support groups for HIV and diabetes.

Janssens, Vienna 2010
Parallel Services in Ethiopia

- ICAP-Ethiopia is adapting HIV tools and systems to support the care of diabetic patients at Adama Hospital, in partnership with the Ethiopian Diabetes Association
  - Appointment systems and calendars
  - Charting tools, flowsheets, family enrollment forms
  - Training, clinical support, and pt education materials
  - Supportive supervision and clinical mentorship
  - Multidisciplinary team meetings
  - Peer educators / expert clients

3. Screen and treat PLWH

Don’t forget:

- As HIV treatment scale-up continues, increasing number of PLWH will live long enough to develop other chronic diseases
- Millions of people living with HIV/AIDS are currently enrolled in care and treatment programs in LMIC – more than 5 million on ART
- Metabolic complications of HIV and some antiretroviral medications increase the risk of other chronic diseases and risk factors (including diabetes and hyperlipidemia)

And finally: Think “systems, not silos”

- HIV and NCD programs are traditionally “silod” throughout the health system, from the facility level to the MOH level up through the WHO level
- Thinking beyond traditional departments and clusters with a “health systems” perspective may strengthen individual programs...and may also enable a more holistic approach to the delivery of primary care services attuned to the local burden of disease
- If the Declaration of Alma Ata were written today, it would very likely include access to continuity care for chronic diseases as a key element of primary care
Acknowledgements

- In Swaziland: Harrison Kamiru, Joris Vandelanotte, Kerry Bruce, Lydia Mpango, Alison Koler, Lindiwe Tsabeledze
- In Ethiopia: Zenebe Melaku, Ahmed Reja, Shibru Berhanu, Yonatan Tadesse
- CDC, USAID, HRSA, and PEPFAR
- The Rockefeller Foundation
- ICAP staff and partners, and the patients who have trusted us with their care

Thank You
Adama Hospital Proof-of-Concept Study: Adapting HIV Systems for Diabetes Care

Dr. Zenebe Melaku
ICAP-Ethiopia Country Director

Outline of Presentation

• Study hypothesis and background
• Outcomes and preliminary data
• Challenges and opportunities

HIV & DM: Hypothesis

Hypothesis:
The tools, systems, and strategies developed to provide continuity care for HIV/AIDS can be rapidly and efficiently adapted to support diabetes services.
HIV & DM: Study Design and Development

- Stakeholder engagement (FMOH, Ethiopian Diabetes Association, Oromiya Regional Health Bureau, hospital leadership, diabetes patients and families)
- Ethical review (Columbia IRB and Ethiopian ethical approvals)
- Funding from the Rockefeller Foundation

HIV & DM: Approach

• Approach:
  - Single time series at one hospital,
  - Intended as a pilot, proof-of-concept study

- Baseline assessment
- Intervention package
- Six Months Follow-up

Study Methods: Baseline and follow-up assessments

• Chart review of adult diabetic patients receiving services at Adama Hospital OPD
  - Only “active” patients included (e.g., visit within past 3 months)
  - N = 260 at baseline, N = 261 at follow-up
Study Design:

**Intervention Package**

- Provision of on-site training:
  - for doctors and nurses on DM care and treatment, in partnership with EDA
- Ongoing clinical mentoring and supportive supervision
- Ensuring an “essential package” of clinical diagnostic equipment (ophthalmoscope, BP cuff, etc)

---

Study Design:

**Intervention Package**

- Adaptation of SOPs and provider support and Client Education Materials

---

Study Design:

**Intervention Package**

- Development of a DM peer educator curriculum
- Training and logistical support for volunteer DM peer educators (no stipends)
Study Design: Intervention Package

**PE Group Education Session**

- Adaptation of charting/patient recording tools (e.g. Intake form, Follow-up form)
- Introduction of appointment book / system for DM within the OPD

**Diabetic Care Follow-up Form**

- Diabetes follow up form, including key data to be recorded at each visit: Weight, BMI, blood pressure, symptoms, smoking status, physical exam (including mouth, foot, eye, and injection site), lab results, treatment, and next appointment
Study Design:

**Intervention Package**

- Simple, standardized data collection and M&E, with ongoing feedback to clinicians

![Multidisciplinary Team Meeting](image)

---

Study Design:

**Intervention Package**

Introduction of Family Focused Care:

- Placed in every chart
- Includes “family tree”
- Lists risk factors for DM
- Outlines eligibility criteria for screening

![Diabetes Family EF](image)

---

Study Design

- No new or experimental services were introduced; all protocols were consistent with local and regional guidelines
- No new clinic was created – patients were seen within OPD, although routine follow-up appointments were scheduled for a fixed day (Thursday)
- No additional support for medications, labs, or transportation was provided
  - No new staff were engaged for implementation – services were provided by existing Adama hospital clinicians supported by existing ICAP-Ethiopia clinical advisors

---
Outline of Presentation

• Study hypothesis and background
• Outcomes and preliminary data
• Lessons learned and opportunities

Outcomes and Preliminary Data

✓ Description of Adama Hospital DM patient cohort
✓ Chart review data

Cohort Characteristics

• There were an average of 230 visits per month for DM services at Adama hospital (range 190 – 287 visits)
• Median age of patients = 47 years (range 18-83 years)
• 51% male, 49% female
• 60% Type 2 diabetes, 37% type 1 diabetes
• 57% currently taking insulin
• Diagnosed with DM for a median of 3 years (range 1-23 years)
• Followed at Adama hospital for a median of 2 years (range 0-22 years)
Baseline chart review:
Baseline Chart Review: Systems and Records

Were the following items ever documented in the patient’s chart?

- Fundoscopic exam: 21%
- Blood pressure: 10%
- Monofilament exam: 5%
- Cigarette use: 0%
- Alcohol use: 0%
- Height: 0%
- Weight: 1%
- BMI: 0%
- Adherence to medications: 18%
- Family members with DM: 1%

% of charts in which item was documented

Baseline chart review:
Baseline Chart Review: Systems and Services

Services provided and documented at least once during the 4 most recent visits

- Weight: 3%
- Assessment of medications: 2%
- Assessment of visual acuity: 4%
- Oral/dental exam: 16%
- Neurological exam: 7%
- Foot exam: 4%
- FLare exam: 2%
- Blood pressure: 48%

Baseline chart review:
Baseline Chart Review: Systems and Services

Services provided and documented at least once during the 3 most recent visits

- Medication adherence assessed: 7%
- DM education provided: 5%
- Next appointment date documented: 1.7%
**Follow-up Chart Review**

<table>
<thead>
<tr>
<th>Service</th>
<th>Yes, at baseline</th>
<th>Yes, at follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundoscopic exam</td>
<td>21%</td>
<td>50%</td>
</tr>
<tr>
<td>Foot exam</td>
<td>30%</td>
<td>81%</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>85%</td>
<td>80%</td>
</tr>
<tr>
<td>Monofilament exam</td>
<td>5%</td>
<td>62%</td>
</tr>
<tr>
<td>Cigarette use</td>
<td>0%</td>
<td>79%</td>
</tr>
<tr>
<td>Alcohol use</td>
<td>0%</td>
<td>54%</td>
</tr>
<tr>
<td>Weight</td>
<td>1%</td>
<td>82%</td>
</tr>
<tr>
<td>BMI</td>
<td>0%</td>
<td>83%</td>
</tr>
<tr>
<td>Medication adherence</td>
<td>38%</td>
<td>18%</td>
</tr>
<tr>
<td>Family members with DM</td>
<td>1%</td>
<td>61%</td>
</tr>
</tbody>
</table>

**Follow-up Chart Review**

<table>
<thead>
<tr>
<th>Service</th>
<th>Yes, at baseline</th>
<th>Yes, at follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood pressure</td>
<td>45%</td>
<td>80%</td>
</tr>
<tr>
<td>Fundoscopic exam</td>
<td>1%</td>
<td>50%</td>
</tr>
<tr>
<td>Foot exam</td>
<td>3%</td>
<td>81%</td>
</tr>
<tr>
<td>Neurologic exam</td>
<td>3%</td>
<td>56%</td>
</tr>
<tr>
<td>Oral/dental exam</td>
<td>6%</td>
<td>82%</td>
</tr>
<tr>
<td>Assessment of visual acuity</td>
<td>4%</td>
<td>49%</td>
</tr>
<tr>
<td>Assessment of injection site</td>
<td>2%</td>
<td>65%</td>
</tr>
<tr>
<td>Weight</td>
<td>2%</td>
<td>82%</td>
</tr>
</tbody>
</table>

**Follow-up Chart Review**

![Diagram showing services offered and documented at least once in the past 3 visits]
Follow-up Chart Review

Preliminary but promising data...

Point-of-service testing for family members of diabetic patients
- Family members tested at clinic, not referred to lab
- 2 of the first 20 family members to be tested for DM were found to have elevated FBG and were linked to further testing and care

Improving patient outcomes on QA/standard of care assessments

Outline of Presentation

- Study hypothesis and background
- Outcomes and preliminary data
- Lessons learned and opportunities
Outcomes - 1

• Marked increase in documented service delivery with no added staff
• Rapid improvement in standards of care
• Effective launch of volunteer DM peer educator program
• Addition of point-of-service testing for family members
• “Eye-opening” experience for hospital physicians and leadership

Outcomes - 2

• There are many opportunities to extend and deepen this project if funding becomes available
  — The study was designed to assess process indicators/outputs only, not clinical or laboratory outcomes
  — Formal costing studies have not yet been performed

Lessons Learned

• This short “proof of concept” study illustrates:
  — the potential to rapidly improve the quality of care and treatment for diabetes by adapting HIV-specific tools and approaches in use at the same facility
  — We infer that these results could apply similarly to other NCDs and chronic conditions
<table>
<thead>
<tr>
<th>Opportunities and Potential Next Steps - 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Could build on this experience to launch a center of excellence / model network, utilizing the tools and approaches developed to address HIV services to enhance NCD services</td>
</tr>
<tr>
<td>• Could extend analyses to include outcomes (adherence, clinical status, laboratory status)</td>
</tr>
<tr>
<td>• Could extend analysis to include formal costing exercise</td>
</tr>
</tbody>
</table>

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**Thank you**

- The patients and families who trust us with their care
- Adama Hospital leadership and Staff
- ICAP staff and partners
- The FMOH and Oromiya Regional Health Bureau
- The Ethiopian Diabetes Association
- The Rockefeller Foundation
Metabolic Complications of HIV

Wafaa El-Sadr, MD, MPH
Director, ICAP
Columbia University

Outline of Presentation

- Epidemiology of HIV
- Evolution of morbidity and mortality
- Spectrum of HIV-related complications
- Pathogenesis of non-AIDS complications
- Conclusions

The Natural History of HIV Infection

[Graph showing the natural history of HIV infection]
Natural History of HIV Disease

Mortality and HAART Use Over Time
U.S. HIV Outpatient Study (N=8566)

Trends in Age-Adjusted Rate of Death due to HIV Infection, USA, 1987-2006

Reference:
Ref: Palella et al., JAIDS 2000 (HOPS dataset updated as of Dec 2007)
ART Scale-up and All-cause Mortality
South Africa 2003–2006

Hyperlipidemia and ART

Lipodystrophy

Carr, A., NEJM 1998
Early reports of Cardiovascular Complications in HIV

- Premature coronary artery disease and myocardial infarctions in young HIV infected patients receiving protease containing ART regimens

Grulich et al, Lancet 1998, 351, 1328

HIV and risk of non-AIDS malignancies

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>HIV/AIDS Incidence Ratio</th>
<th>Transplant Incidence Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung</td>
<td>2.7</td>
<td>2.2</td>
</tr>
<tr>
<td>Leukaemia</td>
<td>3.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Kidney</td>
<td>1.5</td>
<td>6.8</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>1.6</td>
<td>3.1</td>
</tr>
<tr>
<td>Stomach</td>
<td>1.9</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Grulich et al, Lancet 2007

Meta-analysis: 444,172 people with HIV, 31,977 transplant patients
For 20/28 cancers examined there was significantly increased incidence in both groups – strongly suggesting a link with immunodeficiency
HIV and risk of lung cancer, independent of smoking

HIV Infection Is Associated with an Increased Risk for Lung Cancer, Independent of Smoking

Erin B. Jlin, Kristin M. Almeida, Peter R. Boffili, David H. Makri, Shajish Bala, Bruce Vail, June Nam, Jonathan Seeman, and Anil K. Chaturvedi

CID 2007

Elevated risk of lung cancer among people with AIDS


AIDS 2007

HIV and risk of End Stage Renal disease

U.S. Veterans without diabetes

<table>
<thead>
<tr>
<th></th>
<th># people</th>
<th># ESRD</th>
<th>Hazard ratio*</th>
</tr>
</thead>
<tbody>
<tr>
<td>White-HIV -ve</td>
<td>1,201,870</td>
<td>3991</td>
<td>1.0</td>
</tr>
<tr>
<td>White-HIV +ve</td>
<td>6,119</td>
<td>13</td>
<td>0.8 (0.5 – 1.3)</td>
</tr>
<tr>
<td>Black-HIV -ve</td>
<td>206,636</td>
<td>1425</td>
<td>2.0 (1.9 – 2.2)</td>
</tr>
<tr>
<td>Black-HIV +ve</td>
<td>6,816</td>
<td>129</td>
<td>4.6 (3.4 – 6.1)</td>
</tr>
</tbody>
</table>

*Adjusted for age, sex, baseline eGFR category, CAD, HTN, heart failure, COPD, PVD, HCV infection, cerebrovascular disease, and SES.

Little effect of HIV in diabetics


HIV and Cardiovascular Disease

<table>
<thead>
<tr>
<th>Subject source</th>
<th>N CVD cases in HIV +</th>
<th>Risk in HIV + vs. HIV -ve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klein Administrative &amp; clinical management database</td>
<td>72</td>
<td>Increased</td>
</tr>
<tr>
<td>Mary Krause HIV cohort / general population</td>
<td>60</td>
<td>Increased in those with &gt; 18 m PI use</td>
</tr>
<tr>
<td>Currier Administrative database</td>
<td>1360</td>
<td>Increased at younger ages</td>
</tr>
<tr>
<td>Triant Patient Data Registry</td>
<td>189</td>
<td>Increased</td>
</tr>
</tbody>
</table>

Klein et al, JAIDS 2002
Currier et al, JAIDS 2003
Mary Krause et al, AIDS 2003
Triant et al, J Clin Endocrin Metab 2007
HIV and Liver disease

4,865 men and boys with haemophilia (and probable HCV infection), of whom 1,218 HIV-infected.

<table>
<thead>
<tr>
<th>HIV (and haemophilia) status</th>
<th>25 year cumulative risk of liver death</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe haemophilia, not HIV</td>
<td>1.4 (0.7 – 3.0)</td>
</tr>
<tr>
<td>Moderate / mild haemophilia, not HIV</td>
<td>1.2 (0.5 – 2.6)</td>
</tr>
<tr>
<td>HIV-infected (all haemophilia severities)</td>
<td>6.5 (4.5 – 9.5)</td>
</tr>
</tbody>
</table>

Similarly for HBV in MACS – Thié et al, Lancet 2002

Darby et al, Lancet 2007

Spectrum of HIV Complications

- Malignancy
- Nervous System
  - cognitive function
  - neuropathy
- GI
  - diarrhea
- Endocrine
  - Vitamin D deficiency
  - Thyroid disease
  - Diabetes
- Reproductive
  - hypogonadism
- Metabolic
  - hyperlipidemia
  - lacte acidosis

Incidence of Diabetes Mellitus in HIV WHIS

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>PY of follow-up</th>
<th>new DM cases</th>
<th>Incidence Cases/100PY (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI</td>
<td>609</td>
<td>707</td>
<td>20</td>
<td>2.8* [1.6-4.1]</td>
</tr>
<tr>
<td>RTI</td>
<td>932</td>
<td>1486</td>
<td>18</td>
<td>1.2 [0.7-1.8]</td>
</tr>
<tr>
<td>No Rx</td>
<td>816</td>
<td>1480</td>
<td>18</td>
<td>1.2 [0.7-1.8]</td>
</tr>
<tr>
<td>HIV-</td>
<td>350</td>
<td>905</td>
<td>13</td>
<td>1.4 [0.7-2.2]</td>
</tr>
</tbody>
</table>

P = 0.06 comparison with HIV-; p = 0.01 comparison with RTI

RR 1.97 [0.98 – 3.96] compared with HIV-

RR 2.34 [1.24-4.41] compared with RTI

Justman et al, JAIDS 2003

Strengthening Chronic Disease Services: Lessons from WHIS/D program implementation
### Other Studies

- **MACS (longitudinal cohort study of men):**
  - DM was 3.1 times as likely to develop in those on ART as in control subjects over 3 years of observation (Fasting glucose + self report)  
- **IGT prevalence 35% of HIV+ vs 5% healthy controls (age and BMI matched)**
  Hadigan C et al. 2001
- **MS study (cohort of middle-aged HIV+ women):**
  - 6% with previously undiagnosed DM and 13% with IGT by OGTT; non PI ART as risk factor  
  Howard AA et al. 2005

### HIV-Associated Insulin Resistance and its Pathogenesis

- **Protease inhibitors as a cause of insulin resistance**
  - Indinavir inhibits Glut4, an intracellular glucose transporter (Murata 2000)
  - Single 1200 mg dose of IDV in euglycemic hyperinsulinemic humans caused 34% decrease in glucose disposal (Noor 2001)
  - Indinavir alone to HIV-seronegative men for 4 weeks
    - 20% reduction in insulin sensitivity
    - Elevated fasting glucose and insulin levels
    - No change in lipids or body composition  
  (Noor et al, 2002)
- **Fat redistribution as a cause of insulin resistance**
  - In non-HIV patients, central adiposity, especially visceral adipose tissue (VAT) is associated with insulin resistance and increased FFA

### Incidence of Myocardial Infarction by ART Exposure

<table>
<thead>
<tr>
<th>ART Exposure (yrs)</th>
<th>None</th>
<th>&lt;1</th>
<th>1-2</th>
<th>2-3</th>
<th>3-4</th>
<th>4-5</th>
<th>5-6</th>
<th>&gt;6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Events PYFU</td>
<td>16</td>
<td>16</td>
<td>22</td>
<td>24</td>
<td>36</td>
<td>55</td>
<td>39</td>
<td>41</td>
</tr>
</tbody>
</table>

DAD Study
Traditional CVD Risk Factors and Myocardial Infarction

<table>
<thead>
<tr>
<th>Predictor</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age per 5 yrs older</td>
<td>2.13 (1.29-3.52)</td>
</tr>
<tr>
<td>Male sex</td>
<td>4.64 (3.22-6.69)</td>
</tr>
<tr>
<td>Previous CVD</td>
<td>1.32 (1.23-1.41)</td>
</tr>
<tr>
<td>Smoking</td>
<td>2.92 (2.04-4.18)</td>
</tr>
<tr>
<td>Family history</td>
<td>1.40 (0.96-2.02)</td>
</tr>
<tr>
<td>Diabetes (yes vs no)</td>
<td>1.86 (1.31-2.60)</td>
</tr>
</tbody>
</table>

Relative Rate of MI (95% CI)

Predictors of Myocardial Infarction

- ART per additional year: Adjusted RR 1.17 (95% CI: 1.08-1.26)
- Age per 5 year older
- Male sex
- Previous CVD
- Smoking
- Family history

Relative rate of myocardial infarction (95% CI)

Adjusted for family history, BMI, HIV risk, cohort, calendar year and race

Association of Protease Inhibitors and NNRTIs and Myocardial Infarction

- PI: 1.16% (CI 1.10-1.23)
- NNRTI: 1.05% (0.98-1.13)
Pathogenesis of HIV Associated Complications

SMART Study Design

CD4+ cell count >350 cells/mm³

Virologic Suppression (VS) Strategy
[Use of ART to maintain viral load as low as possible throughout follow-up]

Drug Conservation (DC) Strategy
[Stop or defer ART until CD4+ < 250; then episodic ART based on CD4+ cell count to increase counts to > 350]

Plan: 910 primary endpoints, 8 years average follow-up

Increased Risk Opportunistic Disease or Death with Intermittent ART

Logrank = 31.1  p < 0.0001
Continuous ART (VS) Associated with Decreased Risk of Serious AIDS and Non-AIDS Events

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>No. of Patients with Events</th>
<th>Rate** DC</th>
<th>Rate** VS</th>
<th>Hazard Ratio (DC/VS) (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious AIDS</td>
<td>59</td>
<td>1.3</td>
<td>0.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Serious non-AIDS*</td>
<td>186</td>
<td>3.2</td>
<td>2.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Serious AIDS or non-AIDS</td>
<td>239</td>
<td>4.4</td>
<td>2.4</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Favors DC Favors VS **

*Cardiovascular, renal, hepatic, non-AIDS malignancy others ** Per 100 person-years

Effect of ART Interruption on Biomarkers
Change from Baseline to Month 1
SMART Study

<table>
<thead>
<tr>
<th>Marker</th>
<th>DC Group</th>
<th>VS Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N Median M1-bl (IQR)</td>
<td>N Median M1-bl (IQR)</td>
</tr>
<tr>
<td>IL-6</td>
<td>247 0.60 (-0.17-1.87)</td>
<td>249 0.12 (-0.88-0.97)</td>
</tr>
<tr>
<td>D-dimer</td>
<td>248 0.05 (-0.07-0.18)</td>
<td>348 0.00 (-0.13-0.08)</td>
</tr>
</tbody>
</table>

¹ Wilcoxon 2-sided test comparing DC and VS from baseline to month 1

Unifying Framework
HIV-Associated Immune Activation

- HIV replication
- T cell apoptosis
- Immunosuppression
- Coagulation cascade
- Inflammation
- Atherosclerosis
- Liver disease
- Osteoporosis
- Neurocognitive decline
- Renal disease

Strengthening Chronic Disease Services:
Lessons from WUNDS Program Implementation
Survival from Seroconversion Compared to Pre 1996

Mortality in HIV-infected Persons after Seroconversion Compared to General Population

Change in Mortality over Time

Strengthening Chronic Disease Services:
Lessons from WOUNDS Program Implementation
HIV-Related Complications

1981-1996
- Monotherapy
- AIDS-related OI and Malignancies, linked to CD4 levels

1996-2006
- HAART
- AIDS/CI decline
- Emerging Metabolic Complications
- Lipodystrophy
- CVD
- New events linked to ART-PI

2006-
- OI rates remain low with ART
- Non-AIDS Events emerge
- Role of HIV, host factors and ART uncertain

Currier IAS 2008

High Mortality Pre-ART

Survival Probability

Days after Enrollment

Log rank P = 0.0001


High Risk of Early Mortality after ART Initiation:
Resource Poor/Resource Settings

Hazard Ratio (95% CI)

Months from Starting ART

HR unadjusted
HR adjusted for cohort, age, sex, baseline CD4, ART-regimen, disease stage
Spectrum of HIV Complications

Malignancy

nervous system
• cognitive function
• neuropathy

GI
• diarrhea

Endocrine
• Vitamin D deficiency
• Thyroid disease
• Diabetes

Reproductive
• hypogonadism

Metabolic
• hyperlipidemia
• lactic acidosis

Pulmonary
• pulmonary hypertension
• pulmonary fibrosis

Cardiovascular
• hypertension
• atherosclerosis
• vascular disease

Renal
• renal insufficiency

Skeletal/Muscle
• osteoporosis/penia
• fractures
• myopathy
• sarcopenia

Challenges in Diagnosis and Management of HIV Complications

• Laboratory diagnosis
  – HbA1c, lipid levels, biomarkers
• Radiographic procedures
  – Ultrasonography, DEXA, MRI
• Other diagnostics: ECG, biopsy
• Preventive and therapeutic interventions
  – Medications
  – Procedures

Conclusion-I

• Remarkable progress accomplished with expansion of HIV care and antiretroviral therapy
  • Decrease in AIDS-related morbidity and mortality
  • Benefits of ART outweigh their risks
  • Importance of appropriate choice of antiretroviral drugs for longterm treatment
  • Recognition of new complications
  • Metabolic complications & End organ complications
Conclusions-II

- Relative significance of non-AIDS complications with use of ART and at higher CD4+ cell counts
- Pathogenesis of non-AIDS complications multifactorial:
  - Antiretroviral therapy
  - HIV infection itself
    - Immune activation
    - Inflammation
    - Coagulation pathways
  - Host factors
- Urgent need for assessment of prevalence and impact of HIV-related complications in PLWH in resource-limited settings and their appropriate management

Thank you

Amasegenalehu