What Health Ministries Should Know and Can Do: The CardioRenal Connection

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Disclosure of Interests

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Dialysis Providers: Executive Director Peer Kidney Care Initiative with 7 NPO and 7 FP provider groups
Approaches to improve outcomes for populations: Ministries of Health Focus

- Member States within the WHO developed a consensus on Non-Communicable Disease (NCD) objectives: CVD, Cancer, DM and Chronic Respiratory Disease (CRD).

- The Political Declaration on NCDs from the UN Summit in 2011 recognized kidney disease for the first time (Item 19).

  “19. Recognize that renal, oral and eye diseases pose a major health burden for many countries and that these diseases share common risk factors and can benefit from common responses to non-communicable diseases.”

- WHO Target: 25% reduction in NCD deaths by 2025.

- WHO NCD objectives to reduce mortality: 10 year target.
NCDs & Kidney Disease in the Public Health Agenda

- The large public health initiative centers on reducing the impact of the major non-Communicable Disease (NCDs)
  - Cardiovascular Disease (CVD)
  - Diabetes (DM)
  - Cancer
  - Chronic Respiratory Disease (CRD)
- Population level initiatives have focused on Life Style changes to reduce adverse events
  - Tobacco use reduction
  - Salt intake control
  - Dietary energy control
  - Alcohol intake reduction
- Interventions include
  - Blood Pressure Control
  - Cholesterol Control
  - Glycemic control
WHO newest country level data on mortality and NCD deaths

- September 2014 a full report on 162 member States showed the level of progress
- The member States are divided by Gross National Income per Capita (July 2014)
  - Low GNI per capita <$1,045/yr
  - Low middle $1,045 to <$4,125
  - High middle $4,125 to <$12,746
  - High income $12,746+/yr
Ministries of Health and NCDs: What is known and could be done

• Country Profiles on NCDs: Examples that highlight the issues
  – Format will include overall proportion of deaths
  – Age Adjusted NCD death rates
  – Data by country income group

• Blood Pressure control and kidney disease: The CardioRenal Connection

• ESRD burden and growth: High and Middle income country experience

• Kidney Detection and interventions: Kidney Disease as the multiplier disease and confounder for NCD progress
Japan

Total population: 127,000,000
Income Group: High

Age-standardized death rates

Percentage of population living in urban areas: 91.3%
Population proportion between ages 30 and 70 years: 54.0%

Proportional mortality (% of total deaths, all ages, both sexes)

- Cardiovascular diseases: 29%
- Cancers: 30%
- Other NCDs: 12%
- Chronic respiratory diseases: 7%
- Diabetes: 1%
- Injuries: 8%

Total deaths: 1,192,000
NCDs are estimated to account for 79% of total deaths.
United States of America

Total population: 318,000,000
Income Group: High

Percentage of population living in urban areas: 82.4%
Population proportion between ages 30 and 70 years: 50.3%

Proportional mortality (% of total deaths, all ages, both sexes)

Total deaths: 2,656,000
NCDs are estimated to account for 88% of total deaths.
United States of America

Total population: 318,000,000
Income Group: High

Age-standardized death rates

Approx. Decline

- 30% decline
- 16% decline
- 27% decline
- 15% decline
40% decline in CVD Deaths! Cancer is the leading age adjusted cause of death!
40% decline in CVD Deaths! Cancer is the leading age adjusted cause of death!

Canada
Total population: 34 880
Income Group: High

Age-standardized death rates per 100,000 population from 2000 to 2012:
- Cardiovascular Diseases
- Cancers
- Chronic Respiratory Diseases
- Diabetes

Total deaths: 248,000
NCDs are estimated to account for 88% of total deaths.
37% decline in CVD Deaths!

Cancer is the leading age adjusted cause of death!

France
Total population: 63,937,000
Income Group: High

Age-standardized death rate per 100,000

- Cardiovascular Diseases
- Cancers
- Chronic Respiratory Diseases
- Diabetes

Communicable, maternal, perinatal and nutritional conditions: 6%
Injuries: 7%
Other NCDs: 22%
Chronic respiratory diseases: 4%
Diabetes: 2%
Cancers: 31%
Cardiovascular diseases: 20%

Total deaths: 554,000
NCDs are estimated to account for 87% of total deaths.
United Kingdom

Total population: 62,783,000
Income Group: High

Age-standardized death rates

Proportional mortality (% of total deaths, all ages, both sexes)

Cancer is now the leading age adjusted cause of death!
Russian Federation

Total population: 143,000,000
Income Group: High

Age-standardized death rates

Cardiovascular Diseases
Cancers
Chronic Respiratory Diseases
Diabetes

In urban areas: 73.8%
In ages 30 and 70 years: 52.9%

Cardiovascular diseases 60%
Deaths: 2,102,000 to account for 86% of total deaths.
General Observations on NCD death rate in High Income Countries

- CVD death rates generally range between 100-200 deaths/100,000 population (Except Russia at 750)
- Cancer death rate also range between 100-200 deaths/100,000 population
- There has been less progress in death rates from Chronic Respiratory Disease and Diabetes
High Income Countries NCDs and Public Health Infrastructure

- High income countries have established public health infrastructures and have made substantial progress on reducing death rates for CVD and Cancer.
- CVD and DM have been linked to CKD & ESRD for years.
- Education & Interventions are well established to reduce CVD events, kidney disease progression and less costly ESRD replacement services.
Middle income Countries NCDs and Kidney disease-1

Middle income countries are developing public health infrastructures which have contained communicable disease but NCDs have emerged as major challenges to public health and the economy.

CVD death rates tend to range from 300-800 deaths per 100,000 population.

Examples of these countries are:
- Mexico
- Brazil
- China, Thailand, India
- Malaysia, Indonesia, Philippines
- Turkey
- Argentina
World Median Ages

- **Youngest:**
  1. Niger (15.1)
  2. Uganda (15.5)
  3. Mali (16)
  4. Malawi (16.3)
  5. Zambia (16.7)

- **Oldest:**
  1. Germany & Japan (46.1)
  2. Italy (44.5)
  3. Austria (44.3)
  4. Virgin Islands (44.2)

Source: CIA Factbook  
Simran Khosla/GlobalPost

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KDIGO Implementation Strategies Conference  |  June 18-21, 2015  |  Bangkok, Thailand
Little progress in NCD death rates

Mexico

Total population: 121,000,000
Income Group: Upper middle

Age-standardized death rates

Percentage of population living in urban areas: 78.1%
Population proportion between ages 30 and 70 years: 40.5%

Proportional mortality (% of total deaths, all ages, both sexes)

Cardiovascular diseases: 24%
Cancers: 12%
Diabetes: 14%
Chronic respiratory diseases: 6%
Other NCDs: 21%
Communicable, maternal, perinatal, and nutritional conditions: 11%
Injuries: 12%

Total deaths: 605,000
NCDs are estimated to account for 77% of total deaths.
Brazil 24% decline in CVD Deaths!

Total population: 199,000,000
Income Group: Upper middle

Percentage of population living in urban areas: 84.6%
Population proportion between ages 30 and 70 years: 45.0%

Age-standardized death rates

Proportional mortality (% of total deaths, all ages, both sexes)

Total deaths: 1,318,000
NCDs are estimated to account for 74% of total deaths.
Thailand

Total population: 66,785,000
Income Group: Upper middle

15% decline in CVD Deaths!
28% decline in CRD deaths!

Age-standardized death rates*

Proportional mortality (% of total deaths, all ages, both sexes)*

Cardiovascular diseases 20%
Chronic respiratory diseases 9%
Cancers 17%
Other NCDs 12%
Diabetes 4%
Communicable, maternal, perinatal and nutritional conditions 18%
Injuries 11%

Total deaths: 501,000
NCDs are estimated to account for 71% of total deaths.
Argentina

Total population: 41,087,000
Income Group: Upper middle

Age-standardized death rates*

- Cardiovascular Diseases
- Cancers
- Chronic Respiratory Diseases
- Diabetes

Percentage of population living in urban areas: 92.5%
Population proportion between ages 30 and 70 years: 43.9%

Proportional mortality (% of total deaths, all ages, both sexes)*

- Cardiovascular diseases: 35%
- Cancers: 21%
- Chronic respiratory diseases: 7%
- Diabetes: 3%
- Other NCDs: 16%
- Communicable, maternal, perinatal and nutritional conditions: 11%
- Injuries: 7%

Total deaths: 314,000
NCDs are estimated to account for 81% of total deaths.
Malaysia

Total population: 29,240,000
Income Group: Upper middle

Percentage of population living in urban areas: 72.8%
Population proportion between ages 30 and 70 years: 41.0%

Age-standardized death rates

Proportional mortality (% of total deaths, all ages, both sexes)

Cardiovascular diseases 36%
Communicable, maternal, perinatal and nutritional conditions 16%
Injuries 11%
Cancers 15%
Chronic respiratory diseases 7%
Diabetes 3%
Other NCDs 12%

Total deaths: 146,000
NCDs are estimated to account for 73% of total deaths.
Turkey

Total population: 73,997,000
Income Group: Upper middle

Age-standardized death rates*

Percentage of population living in urban areas: 71.5%
Population proportion between ages 30 and 70 years: 43.6%

Proportional mortality (% of total deaths, all ages, both sexes)**

**Total deaths: 422,000
NCDs are estimated to account for 86% of total deaths.
China

Total population: 1,390,000,000
Income Group: Upper middle

Percentage of population living in urban areas: 50.6%
Population proportion between ages 30 and 70 years: 51.5%

Age-standardized death rates:

- Cardiovascular Diseases
- Chronic Respiratory Diseases
- Diabetes
- Cancers
- Other NCDs
- Communicable, maternal, perinatal and nutritional conditions
- Injuries

Proportional mortality (% of total deaths, all ages, both sexes):

- Cardiovascular diseases: 45%
- Cancers: 29%
- Chronic respiratory diseases: 11%
- Diabetes: 2%
- Other NCDs: 6%
- Communicable, maternal, perinatal and nutritional conditions: 5%
- Injuries: 8%

Total deaths: 9,846,000
NCDs are estimated to account for 87% of total deaths.
High-Middle Income Countries NCD death Rates

• There is considerable diversity in the middle income countries progress toward NCD death rates

• China with its huge population is quite different from other High-Middle income countries

• What about the Low-Middle Income Countries?
Communicable Diseases are a continuing issue.
Little progress in CVD and CRD death rates
Egypt

Total population: 80,722,000
Income Group: Lower middle

Percentage of population living in urban areas: 43.5%
Population proportion between ages 30 and 70 years: 37.3%

Age-standardized death rates

Total deaths: 523,000
NCDs are estimated to account for 85% of total deaths.

Proportional mortality (% of total deaths, all ages, both sexes)

Cardiovascular diseases: 48%
Diabetes: 14%
Chronic respiratory diseases: 4%
Caners: 19%
Other NCDs: 19%
Injuries: 5%
Communicable, maternal, perinatal and nutritional conditions: 11%
Philippines

NCD death rates have increased

Total population: 98,707,000
Income Group: Lower middle

Age-standardized death rates

Percentage of population living in urban areas: 48.8%
Population proportion between ages 30 and 70 years: 35.2%

Proportional mortality (% of total deaths, all ages, both sexes)

Total deaths: 571,000
NCDs are estimated to account for 67% of total deaths.
Low-Middle Income Country NCD Challenges

• The diversity of outcomes poses important challenges to Ministries of Health on the breath of NCD death interventions verses Communicable Diseases

• The issues related to kidney disease may be overshadowed by other larger public health considerations

• What about Low Income countries
Cambodia

Total population: 14,865,000
Income Group: Low

Communicable Diseases are a continuing issue. Little progress in CVD and CRD death rates

Percentage of population living in urban areas: 20.0%
Population proportion between ages 30 and 70 years: 33.8%

Age-standardized death rates

Proportional mortality (% of total deaths, all ages, both sexes)

Cardiovascular diseases: 24%
Communicable, maternal, perinatal, and nutritional conditions: 37%
Cancers: 13%
Chronic respiratory diseases: 4%
Other NCDs: 9%
Diabetes: 2%
Injuries: 11%

Total deaths: 85,000
NCDs are estimated to account for 52% of total deaths.
Communicable Diseases are a continuing issue. Little progress in CVD and CRD death rates.
Communicable Diseases are a continuing issue. Little progress in CVD and CRD death rates.

Bangladesh

Total population: 155,000,000
Income Group: Low

Age-standardized death rates*

Proportional mortality (% of total deaths, all ages, both sexes)*

Total deaths: 886,000
NCDs are estimated to account for 59% of total deaths.
NCDs and Kidney Disease: The CardioRenal Agenda

- CVD is the leading cause of death in most middle and high income countries
- Death rates for NCDs declined in most High Income countries consistent with the targets
- The heavy burden of CVD and Diabetes is highly interactive with kidney disease
- Interventions for kidney disease are similar to CVD, HTN and DM: ACE-I/ARBs, Beta Blockers etc
- Kidney Disease progression is not only the multiplier disease but it may limit effective treatments for CVD because of hyperkalemia risk
- The CardioRenal Connection is the core issue for disease management and farther progress in reducing NCD death rates particularly High-Income Countries
Blood Pressure Control is a Central Issue for CardioRenal Disease!

Data Source: National Health and Nutrition Examination Survey (NHANES), 1988–1994, 1999-2004 & 2007–2012 participants age 20 & older. Single-sample estimates of eGFR & ACR; eGFR calculated using the CKD-EPI equation. Figure represents all hypertensives plus those hypertensive participants that are at target blood pressure, probably due to medication. Abbreviations: ACR, urine albumin/creatinine ratio; CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate.
Many high, Middle and Low income countries continue to have increasing incidence rates.

- Russia competing CVD death risk limits ESRD
- In Bangladesh, the young age and communicable disease risk limits ESRD

Data source: Special analyses, USRDS ESRD Database. All rates are unadjusted. Data are shown for countries with incidence increase or decrease from 2006 to 2012 or 2011. Data for U.S. are shown for comparison purposes.

Abbreviations: ESRD, end-stage renal disease.
Many high income countries have contained the incidence rates. However, they have a young population. Columbia is a notable except!
vol 2 Figure 10.6 Trends in the prevalence of ESRD, per million population, by country, years 2000-2012

(A) Countries in which the prevalence of ESRD increased by 15-31 % from 2006-2012

Data source: Special analyses, USRDS ESRD Database. All rates are unadjusted. Data for U.S. are shown for comparison purposes. Abbreviations: ESRD, end-stage renal disease.
Figure 10.6: Trends in the prevalence of ESRD, per million population, by country, years 2000-2012

(B) Countries in which the prevalence of ESRD increased by greater than 31% from 2006-2012

Data source: Special analyses, USRDS ESRD Database. All rates are unadjusted. Data for U.S. are shown for comparison purposes.

Abbreviations: ESRD, end-stage renal disease.
Public Health Challenge of NCDs and the subgroup with Kidney Disease

• Incidence rates have slowed in many high income countries which is consistent with the progress in NCD treatment, control of risk factors and declining death rates

• Low and Low-Middle Income countries have young populations which have not developed NCDs and also have low ESRD rates

• Prevalence rates, however, continue to rise based on increased survival thereby stressing Ministry of Health budgets
Detection and Prevention is the only choice

- In Middle-Income countries expanding public health programs targeting CVD, hypertension and diabetes still has the greatest potential for prevention of NCDs.
- CVD and DM treatment uses the same drugs as in the Kidney disease population thereby targeting the three diseases multiplies.
- The poorest risk factor control is within the kidney disease population.
Ministries of Health NCDs and Kidney Disease

The only rational solution is detection and prevention!

ESRD treatment will be vulnerable to limited resources including water and skilled health care workers!
World Wide Projected Renal Replacement Therapy: Current and Projected Demand

*The Lancet 2015 385, 1975-1982*

The RRT Demand has huge current & future budgetary implications such that MOH and Finance cannot ignore the looming implications!