NATIONAL HEALTH POLICIES AND STRATEGIES ON DIABETES AND CKD BURDEN IN THE ASIA PACIFIC REGION

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India

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Jan 19-20, 2024
Goals

1. Review national health policies /programs/initiatives in prioritizing diabetes and CKD care in the Asian Pacific (AP) region as part of the non-communicable disease directives

2. Discuss current gaps in diabetes and CKD care in the AP region in relation to countries of different income levels

3. Provide insights on high level strategies to bridge gaps in care and to have healthcare sustainability
Diabetes is a highly prevalent, global disease
Estimated age-adjusted comparative prevalence of diabetes
In adults aged 20–79 years in 2021
So is CKD…

The global prevalence of CKD is over **843 million**


**Meta-analysis estimating the global prevalence of CKD (stages 3–5)**

- **Europe**
  - 11.86% (9.93, 13.79)
  - **South Asia**
    - India, Bangladesh: 6.76% (3.68, 9.85)
    - China, Taiwan, Mongolia: 10.06 (6.63, 13.49)
    - Japan, South Korea, Oceania: 11.73 (5.36, 18.10)
- **Africa**
  - 7.60% (6.10, 9.10)
  - South Africa, Senegal, Congo: 7.60% (6.10, 9.10)
- **North America**
  - Canada, USA: 14.44% (8.52, 20.36)
- **Latin America**
  - Chile: 12.10% (11.72, 12.48)
- **Middle East**
  - Iran: 11.68% (4.51, 18.84)
- **Australasia**
  - Australia: 8.14% (4.48, 11.79)

The global incidence of CKD is over **19 million**

The global prevalence of CKD is over **843 million**

**CKD** = chronic kidney disease.

The causes of CKD are diverse, with diabetes and hypertension responsible for more than half of all cases.

Age-standardized global prevalence rate of CKD by cause per 100,000 persons in 2016

- Diabetes: 1690.73, 42%
- Hypertension: 744.10, 18%
- Glomerulonephritis: 735.69, 18%
- Other: 886.03, 22%

CKD = chronic kidney disease.
Average yearly change in incidence of treated ESKD attributed to diabetes, 2010-2020

https://diabetesatlas.org/
Improvement in Diabetes and CKD Mortality Has Been Limited

**Global Age-standardized Mortality Rate (per 100,000)**

**Percent Change, 2007-2017**

<table>
<thead>
<tr>
<th>Condition</th>
<th>2007</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKD</td>
<td>1.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-9.7</td>
<td>-13.6</td>
</tr>
<tr>
<td>IHD</td>
<td>-13.6</td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>-13.6</td>
<td></td>
</tr>
<tr>
<td>COPD</td>
<td></td>
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</tr>
</tbody>
</table>

**Number of Patients Receiving KRT, 2010-2020**

- **Asia**: (0.968-2.162)
- **North America**: (0.637-1.260)
- **Europe**: (0.532-0.825)
- **Latin America, Caribbean**: (0.373-0.903)
- **Africa**: (0.083-0.236)
- **Oceania**: (0.025-0.053)

CKD = chronic kidney disease; COPD = chronic obstructive pulmonary disorder; RRT = renal replacement therapy.

Diabetes and CKD are 2 of the top 3 fastest growing causes of death in the world.
CKD and Diabetes will become the 5th and 7th leading COD in 2040

<table>
<thead>
<tr>
<th>Leading causes 2016</th>
<th>Leading causes 2040</th>
<th>Mean % change number of YLLs</th>
<th>Mean % change all-age YLL rate</th>
<th>Mean % change age-standardised YLL rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ISHAEMIC HEART DISEASE</td>
<td>1 ISHAEMIC HEART DISEASE</td>
<td>-3.6 (-43.1 to 40.9)</td>
<td>-18.3 (-52.3 to 19.9)</td>
<td>-44.8 (-66.7 to -18.6)</td>
</tr>
<tr>
<td>2 STROKE</td>
<td>2 STROKE</td>
<td>-10.7 (-40.1 to 31.9)</td>
<td>-24.4 (-49.3 to 12.3)</td>
<td>-49.0 (-65.7 to -25.0)</td>
</tr>
<tr>
<td>3 LOWER RESPIRATORY INFECTIONS</td>
<td>3 LOWER RESPIRATORY INFECTIONS</td>
<td>-24.8 (-47.9 to 3.4)</td>
<td>-36.3 (-56.5 to -12.3)</td>
<td>-39.1 (-60.6 to -8.9)</td>
</tr>
<tr>
<td>4 DIARRHEAL DISEASES</td>
<td>4 COPD</td>
<td>32.1 (-9.8 to 98.4)</td>
<td>11.9 (-26.4 to 68.2)</td>
<td>-29.2 (-55.3 to 8.0)</td>
</tr>
<tr>
<td>5 ROAD INJURIES</td>
<td>5 CHRONIC KIDNEY DISEASE</td>
<td>100.3 (83.2 to 302.1)</td>
<td>69.8 (-8.5 to 244.6)</td>
<td>23.9 (-32.1 to 153.2)</td>
</tr>
<tr>
<td>6 MALARIA</td>
<td>6 ALZHEIMER'S DISEASE</td>
<td>131.2 (90.9 to 196.6)</td>
<td>95.8 (60.1 to 151.8)</td>
<td>1.8 (-22.3 to 41.5)</td>
</tr>
<tr>
<td>7 NEONATAL PRETERM BIRTH</td>
<td>7 DIABETES</td>
<td>76.7 (10.3 to 228.8)</td>
<td>4.8 (-6.6 to 18.4)</td>
<td>4.6 (-35.4 to 106.8)</td>
</tr>
<tr>
<td>8 HIV/AIDS</td>
<td>8 ROAD INJURIES</td>
<td>-18.3 (-31.7 to 8.5)</td>
<td>-30.8 (-42.3 to -8.6)</td>
<td>-29.9 (-41.4 to -6.1)</td>
</tr>
<tr>
<td>9 COPD</td>
<td>9 LUNG CANCER</td>
<td>-20.7 (-9.0 to 60.5)</td>
<td>2.2 (-23.1 to 35.6)</td>
<td>-28.7 (-46.8 to -6.6)</td>
</tr>
<tr>
<td>10 NEONATAL ENCEPHALOPATHY</td>
<td>10 DIARRHEAL DISEASES</td>
<td>-39.7 (-75.5 to 47.0)</td>
<td>-48.9 (-79.8 to 23.9)</td>
<td>-49.6 (-77.9 to 10.4)</td>
</tr>
<tr>
<td>11 TUBERCULOSIS</td>
<td>11 SELF-HARM</td>
<td>7.8 (-15.2 to 41.9)</td>
<td>-8.7 (-28.4 to 20.0)</td>
<td>-11.5 (-30.6 to 17.1)</td>
</tr>
<tr>
<td>12 CONGENITAL DEFECTS</td>
<td>12 HIV/AIDS</td>
<td>-30.4 (-41.8 to 20.3)</td>
<td>-41.1 (-79.8 to 23.9)</td>
<td>-36.9 (-48.0 to -27.2)</td>
</tr>
<tr>
<td>13 LUNG CANCER</td>
<td>13 LIVER CANCER</td>
<td>69.6 (30.7 to 135.2)</td>
<td>43.8 (9.9 to 102.9)</td>
<td>8.8 (18.5 to 53.6)</td>
</tr>
<tr>
<td>14 SELF-HARM</td>
<td>14 HYPERTENSIVE HEART DISEASE</td>
<td>89.9 (6.3 to 358.7)</td>
<td>61.1 (-10.3 to 285.2)</td>
<td>6.0 (-42.4 to 158.9)</td>
</tr>
<tr>
<td>15 DIABETES</td>
<td>15 COLORECTAL CANCER</td>
<td>59.1 (18.3 to 123.9)</td>
<td>34.8 (-0.3 to 88.4)</td>
<td>-5.8 (-31.6 to 33.4)</td>
</tr>
<tr>
<td>16 CHRONIC KIDNEY DISEASE</td>
<td>16 TUBERCULOSIS</td>
<td>-40.0 (-52.8 to -19.7)</td>
<td>-49.1 (-60.4 to -31.8)</td>
<td>-54.9 (-64.9 to -38.6)</td>
</tr>
<tr>
<td>17 OTHER NEONATAL</td>
<td>17 CONGENITAL DEFECTS</td>
<td>-50.0 (-58.1 to -41.3)</td>
<td>-33.3 (-43.9 to -21.9)</td>
<td>-33.3 (-43.9 to -21.9)</td>
</tr>
<tr>
<td>18 ALZHEIMER'S DISEASE</td>
<td>18 NEONATAL PRETERM BIRTH</td>
<td>-57.0 (-66.4 to -48.9)</td>
<td>-63.6 (-71.4 to -57.0)</td>
<td>-48.9 (-59.3 to -39.9)</td>
</tr>
<tr>
<td>19 NEONATAL SEPSIS</td>
<td>19 BREAST CANCER</td>
<td>46.2 (13.0 to 89.0)</td>
<td>23.9 (-5.3 to 61.0)</td>
<td>-1.6 (-24.9 to 29.1)</td>
</tr>
<tr>
<td>20 LIVER CANCER</td>
<td>20 FALLS</td>
<td>-24.1 (16.0 to 33.2)</td>
<td>-5.1 (-2.6 to 10.3)</td>
<td>-18.8 (-26.8 to -10.3)</td>
</tr>
</tbody>
</table>

Foreman et al, Lancet 2018: 2052-2090
Global inequity in diabetes

In the next 30 years, the number of adults with diabetes worldwide will more than double. Minoritised communities are disproportionately affected by the disease.

Number of adults with diabetes worldwide

By 2045, three in four adults with diabetes will be from low-income and middle-income countries (LMICs).

Within high-income countries (HICs), such as the USA, prevalence of diabetes in minoritised groups is nearly 1.5 times higher than in White groups.

In 2021, approximately half of global disability-adjusted life-years due to type 2 diabetes was attributed to high BMI.

As of 2019, diabetes-related mortality rates and disability-adjusted life-years were nearly double in LMICs compared with HICs.

https://www.thelancet.com/series/global-inequity-diabetes
Age-standardized CKD DALYs rate by SDI quintiles

Bikbov B, ...Jha V... et al Lancet 2020
The actual burden in LMICs of APAC may be greater than previously estimated.

**Kidney disease**
in Uddanam, Andhra Pradesh

*Out of every 100 persons*

- 42 had high blood pressure
- 13 had diabetes
- 14 had another family member affected with kidney disease

9 out of every 10 persons with CKD did not know they had the disease.
Executive summary of the KDIGO 2022 Clinical Practice Guideline for Diabetes Management in Chronic Kidney Disease: an update based on rapidly emerging new evidence

Peter Rossing1, M. Luiza Caramori1,Juliana C.N. Chan4,5, Hiddo J.L. Heerspink6, Clint Hurst7, Kamllesh Khunti8, Adrian Liew9, Erin D. Michos10, Sankar D. Navaneethan1,12, Wasiu A. Olouwu8, Tami Sadovsky1, Nikhil Tandon1, Katherine R. Tuttle9, Christoph Wanner17, Katy G. Winkel19, Sophia Zoungas18, Jonathan C. Craig18,20, David J. Tunnicliffe19,22, Marcello A. Tonelli22, with Michael Cheung18, Amy Earley20 and Ian H. de Boer22

The case for early identification and intervention of a chronic kidney disease: conclusions from a Kidney Disease: Improving Global Outcomes (KDIGO) Controversies Conference

Michael G. Shlipak1, Sri Lekha Tummala2, L. Ebony Boulware3, Morgan E. Grams4, Joachim H. Ix5,6,7, Vivekanand Jha2,8,9, Andre-Pascal Kennege11,12, Magdalena Madero13, Borisla Mihaylova14,15,16, Naveep Tangri17, Michael Cheung18, Michel Jadoul19, Wolfgang C. Winkelmayer22 and Sophia Zoungas18,20, for Conference Participants23

Executive summary of the KDIGO 2021 Clinical Practice Guideline for the Management of Blood Pressure in Chronic Kidney Disease

Cheng1, William C. Cushman3, Susan L. Furth4,5, Fan Fan Hou6, Joachim H. Ix7,8, Kristin9, Roberto Pecoi-filho10,11,13, Mark J. Sarnak13, Sheldon W. Tobe14,15,17, Yehov Lytvyn17,18, Jonathan C. Craig19,20, David J. Tunnicliffe21,22, Io Tonelli22, Michael Cheung18, Amy Earley23 and Johannes F.E. Mann26
Challenges to traditional outcomes research

It takes an average of 17 years of before research findings are translated to practice

Prescription Practices in Patients with Mild to Moderate Chronic Kidney Disease in India

Why does it take so long and why is the uptake so poor?

Conclusion This study highlights the missed opportunities for improving outcomes through appropriate prescriptions of drugs in patients with CKD. There is need for dissemination of evidence-based guidelines and institution of sustainable implementation practices for improving the overall health of subjects with CKD.
National health policies for CKD in APAC region
Existence of national strategies

National Strategies for NCD care

National Strategies for CKD care
Existence of kidney disease specific policies

- **S Asia**: 100%
- **OSEA**: 80% Yes, 20% Unknown
- **N&E Asia**: 80% Yes, 20% Unknown
Government recognition of kidney disease as health priorities

[Bar chart showing the percentage of government recognition of kidney disease in different regions.]

- **AKI**
  - Africa: 18%
  - Eastern and Central Europe: 6%
  - Latin America: 19%
  - The Middle East: 36%
  - NIS and Russia: 30%
  - North America & Caribbean: 25%
  - North and East Asia: 0%
  - OSEA: 17%
  - South Asia: 0%
  - Western Europe: 23%

- **CKD**
  - Africa: 49%
  - Eastern and Central Europe: 38%
  - Latin America: 57%
  - The Middle East: 82%
  - NIS and Russia: 70%
  - North America & Caribbean: 58%
  - North and East Asia: 0%
  - OSEA: 33%
  - South Asia: 29%
  - Western Europe: 23%

- **Kidney failure and KRT**
  - Africa: 51%
  - Eastern and Central Europe: 44%
  - Latin America: 57%
  - The Middle East: 91%
  - NIS and Russia: 60%
  - North America & Caribbean: 83%
  - North and East Asia: 83%
  - OSEA: 83%
  - South Asia: 43%
  - Western Europe: 64%
### Treatment availability for kidney diseases

<table>
<thead>
<tr>
<th>Region</th>
<th>AKI</th>
<th>CKD</th>
<th>Kidney failure and KRT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>13%</td>
<td>31%</td>
<td>26%</td>
</tr>
<tr>
<td>Eastern and Central Europe</td>
<td>19%</td>
<td>38%</td>
<td>24%</td>
</tr>
<tr>
<td>Latin America</td>
<td>5%</td>
<td>27%</td>
<td>18%</td>
</tr>
<tr>
<td>The Middle East</td>
<td>9%</td>
<td>40%</td>
<td>33%</td>
</tr>
<tr>
<td>NIS and Russia</td>
<td>20%</td>
<td>50%</td>
<td>60%</td>
</tr>
<tr>
<td>North America &amp; Caribbean</td>
<td>17%</td>
<td>56%</td>
<td>33%</td>
</tr>
<tr>
<td>North and East Asia</td>
<td>0%</td>
<td>67%</td>
<td>33%</td>
</tr>
<tr>
<td>OSEA</td>
<td>6%</td>
<td>33%</td>
<td>28%</td>
</tr>
<tr>
<td>South Asia</td>
<td>0%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>14%</td>
<td>50%</td>
<td>45%</td>
</tr>
</tbody>
</table>
## Barriers to care

<table>
<thead>
<tr>
<th>Distance from care, Geography</th>
<th>Physician availability/access</th>
<th>Knowledge/attitude amongst PLWKD</th>
<th>Nephrologist knowledge/attitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>85%</td>
<td>78%</td>
<td>80%</td>
</tr>
<tr>
<td>Eastern and Central Europe</td>
<td>25%</td>
<td>63%</td>
<td>56%</td>
</tr>
<tr>
<td>Latin America</td>
<td>68%</td>
<td>64%</td>
<td>68%</td>
</tr>
<tr>
<td>The Middle East</td>
<td>36%</td>
<td>100%</td>
<td>73%</td>
</tr>
<tr>
<td>NIS and Russia</td>
<td>20%</td>
<td>80%</td>
<td>70%</td>
</tr>
<tr>
<td>North America &amp; Caribbean</td>
<td>42%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>North and East Asia</td>
<td>33%</td>
<td>67%</td>
<td>83%</td>
</tr>
<tr>
<td>OSEA</td>
<td>79%</td>
<td>79%</td>
<td>95%</td>
</tr>
<tr>
<td>South Asia</td>
<td>88%</td>
<td>88%</td>
<td>75%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>41%</td>
<td>50%</td>
<td>55%</td>
</tr>
</tbody>
</table>

*Note: The highlighted region indicates areas with significant challenges.*
### Barriers to care (contd)

<table>
<thead>
<tr>
<th>Health system availability/access/capability</th>
<th>Lack of political priority</th>
<th>Poor funding/reimbursement</th>
<th>Other factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>76%</td>
<td>63%</td>
<td>85%</td>
</tr>
<tr>
<td>Eastern and Central Europe</td>
<td>19%</td>
<td>38%</td>
<td>25%</td>
</tr>
<tr>
<td>Latin America</td>
<td>59%</td>
<td>50%</td>
<td>59%</td>
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<tr>
<td>The Middle East</td>
<td>64%</td>
<td>27%</td>
<td>64%</td>
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<tr>
<td>NIS and Russia</td>
<td>60%</td>
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<td>80%</td>
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<tr>
<td>North America &amp; Caribbean</td>
<td>75%</td>
<td>50%</td>
<td>67%</td>
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<tr>
<td>North and East Asia</td>
<td>67%</td>
<td>17%</td>
<td>68%</td>
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<tr>
<td>OSEA</td>
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<td>74%</td>
<td>68%</td>
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<tr>
<td>South Asia</td>
<td>88%</td>
<td>88%</td>
<td>75%</td>
</tr>
<tr>
<td>Western Europe</td>
<td>32%</td>
<td>45%</td>
<td>18%</td>
</tr>
</tbody>
</table>
Healthcare services for diagnosis and management of CKD

Primary care

Secondary/Tertiary care

Htay H,… Jha V et al Kidney Int Suppl 2018
## Funding for non-dialysis CKD

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Publicly funded by government and free at point of delivery n (%)</th>
<th>Publicly funded by government but with some fees at point of delivery n (%)</th>
<th>A mix of publicly funded (whether or not publicly funded component is free at point of delivery) and private systems. N (%)</th>
<th>Solely private and out-of-pocket n (%)</th>
<th>Solely private through health insurance providers n (%)</th>
<th>Multiple systems: programs provided by government, NGOs, and communities. N (%)</th>
<th>Other n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall</strong></td>
<td>167</td>
<td>45 (27)</td>
<td>32 (19)</td>
<td>62 (37)</td>
<td>8 (5)</td>
<td>1 (1)</td>
<td>15 (9)</td>
<td>4 (2)</td>
</tr>
<tr>
<td><strong>ISN region</strong></td>
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<td></td>
</tr>
<tr>
<td>Africa</td>
<td>41</td>
<td>4 (10)</td>
<td>10 (24)</td>
<td>14 (34)</td>
<td>7 (17)</td>
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<td>0 (0)</td>
<td>4 (10)</td>
</tr>
<tr>
<td>Eastern &amp; Central Europe</td>
<td>16</td>
<td>7 (44)</td>
<td>4 (25)</td>
<td>5 (31)</td>
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<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
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<tr>
<td>Latin America</td>
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<td>3 (14)</td>
<td>13 (59)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>5 (23)</td>
</tr>
<tr>
<td>Middle East</td>
<td>11</td>
<td>3 (27)</td>
<td>1 (9)</td>
<td>6 (55)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (9)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>NIS &amp; Russia</td>
<td>10</td>
<td>3 (30)</td>
<td>3 (30)</td>
<td>3 (30)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>1 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td><strong>North America &amp; the Caribbean</strong></td>
<td>12</td>
<td>5 (25)</td>
<td>3 (25)</td>
<td>6 (30)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>North &amp; East Asia</td>
<td>6</td>
<td>1 (17)</td>
<td>3 (50)</td>
<td>2 (33)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>OSEA</td>
<td>19</td>
<td>4 (21)</td>
<td>3 (16)</td>
<td>9 (47)</td>
<td>1 (5)</td>
<td>0 (0)</td>
<td>2 (11)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>South Asia</td>
<td>8</td>
<td>3 (38)</td>
<td>0 (0)</td>
<td>2 (25)</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>2 (25)</td>
<td>1 (13)</td>
</tr>
<tr>
<td>Western Europe</td>
<td>22</td>
<td>16 (73)</td>
<td>2 (9)</td>
<td>2 (9)</td>
<td>0 (0)</td>
<td>1 (5)</td>
<td>0 (0)</td>
<td>1 (5)</td>
</tr>
</tbody>
</table>
National capacity for prevention and control of diabetes
Countries having national diabetes policy
Countries with diabetes guidelines
Essential diabetes medicines in public pharmacies
Availability of basic technologies for diabetes care
Other findings

• Insulin is generally available only in 23% of LICs
• Blood glucose measurement generally available in 50% of LICs
• < 50% of countries have conducting a national population-based survey with blood glucose measurement
• Only 1 in 3 LICs report general availability of the most basic technologies for diagnosis and management of diabetes
KDIGO Controversies Conference on Maintaining Kidney Health and Preventing CKD
Implementation strategies

• Aim for a lifespan approach to health
  • Ensure a healthy state free from illness and development of disease that results in premature death or functional disability. It may focus on, but not limit to, kidney health.

• Generalization and equality for all people act as the supreme and universal principle, supported by policies of governments and resources from public and private sectors.

• Medical professionals and health workers collaborate with patients and citizens, promoting the concepts and conducting the behaviors of healthy lifestyle.

• Early detection through optimal screening project prevents the development of disease.

• Appropriate management by medical treatment and care, based on comprehensive researches and update guidelines, retard the disease progression.
Implementation strategies

- Engagement of policymakers and public in a different way
- Breaking down CKD prevention into smaller, attainable goals
- Don’t set your goal with policymakers too far (reduce incidence of CKD)
  - Set more near-term horizon with objectives that you can reach and maintain momentum
  - Move beyond medical issues to include SDOH/economic determinants of well being
- New therapies promise more readily available cost-effectiveness data to justify ROI
  - Models can be used to show potential benefits to government
    - Inputs of economic models are similar internationally except for costs of drugs
- Consider missing perspectives (e.g. Africa v. health systems in developed countries)

Wong L, Jha V
CONCLUSIONS

Huge unmet need for care of CKD subjects in globally, more so in resource poor regions

Large demand-supply gaps

Western “nephrologist-centric” models of care unlikely to work

We need to become smarter to manage this burden

Nephrologists and community physicians have to work together

Implementation of smart preventive methods