## EUPHA-Steering Committee Chronic Disease Section

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saverio Stranges</td>
<td>Professor and Chair, Department of Epidemiology and Biostatistics, Western University</td>
<td>Canada/Italy</td>
</tr>
<tr>
<td>Sarah Cuschieri</td>
<td>Lecturer, University of Malta (Vice-President)</td>
<td>Malta</td>
</tr>
<tr>
<td>Elio Riboli</td>
<td>Founding Dean, School of Public Health Imperial College London</td>
<td>UK</td>
</tr>
<tr>
<td>Tatjana Makovski</td>
<td>Researcher, Sante Publique France, Paris</td>
<td>France</td>
</tr>
<tr>
<td>Andrzej M. Fal</td>
<td>President, Polish Society of Public Health</td>
<td>Poland</td>
</tr>
<tr>
<td>Valentina A. Andreeva</td>
<td>Associate Professor Nutritional Epidemiology Research Group/EREN Université Sorbonne Paris Nord</td>
<td>France</td>
</tr>
<tr>
<td>Julian Mamo</td>
<td>Professor, University of Malta (Vice-President)</td>
<td>Malta</td>
</tr>
<tr>
<td>Licia Iacoviello</td>
<td>Professor IRCCS Istituto Neurologico Mediterraneo &amp; Libera Università Mediterranea, Bari</td>
<td>Italy</td>
</tr>
<tr>
<td>Robby De Pauw</td>
<td>Researcher, Sciensano</td>
<td>Belgium</td>
</tr>
<tr>
<td>Iveta Nagyova</td>
<td>President EUPHA, Head Department of Social and Behavioural Medicine, PJ Safarik University</td>
<td>Slovakia</td>
</tr>
<tr>
<td>Raffaele Palladino</td>
<td>Professor, University of Naples Federico II</td>
<td>Italy</td>
</tr>
<tr>
<td>Jinane Ghattas</td>
<td>Researcher, Sciensano Cancer Centre Department of Epidemiology and Public Health</td>
<td>Belgium</td>
</tr>
<tr>
<td>Antonio Sarría-Santamena</td>
<td>Professor, Nazarbayev University School of Medicine</td>
<td>Kazakhstan</td>
</tr>
<tr>
<td>Franca Barbic</td>
<td>Associate Professor, Humanitas University, Milan</td>
<td>Italy</td>
</tr>
<tr>
<td>Piotr Wilk</td>
<td>Associate Professor, Department of Epidemiology and Biostatistics, Western University</td>
<td>Canada</td>
</tr>
</tbody>
</table>
Outline

✓ Global epidemiological trends with focus on CVD (“Paradigm Shift”)
✓ Reconciling ageing, multimorbidity and COVID-19…
✓ Traditional and emerging risk factors
✓ Role of social determinants of health
✓ Lessons learned, policy implications & way forward…
My Academic & Professional Journey so far…
From the Mediterranean Sea and Vesuvius...
>42,000 students - 2,449 full-time staff
Department of Epidemiology and Biostatistics
Western Centre for Public Health & Family Medicine
Epidemiological & Nutritional Transition: Impact on CVD in low-resource settings…

Increasing levels of acculturation, urbanization and affluence

Int J Epidemiol. 2004
CENTRAL ILLUSTRATION: Cardiovascular Disease Burden Across Time, Location, Cause, and Risk Factor

Percent Change in Age-Standardized CVD Death Rate from 2010-2019

Number of CVD Deaths

Countries with the Highest Number of CVD Deaths

Proportion of CVD Deaths by Cause (2019)

Ischemic heart disease (49.2%)
Non-rheumatic valvular heart disease (0.9%)
Rheumatic heart disease (1.0%)
Endocarditis (0.4%)
Ischemic stroke (17.7%)
Intracerebral hemorrhage (15.5%)
Other cardiovascular and circulatory diseases (1.5%)
Aortic aneurysm (0.9%)
Atrial fibrillation and flutter (4.7%)
Cardiomyopathy and myocarditis (1.8%)
Hypertensive heart disease (6.2%)
Peripheral artery disease (0.4%)
Subarachnoid hemorrhage (2.2%)

CVD Burden Attributable to Modifiable Risk Factors

### CVD Burden Attributable to Modifiable Risk Factors

<table>
<thead>
<tr>
<th>1990 Rank</th>
<th>2019 Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. High systolic blood pressure</td>
<td>1. High systolic blood pressure</td>
</tr>
<tr>
<td>2. Dietary risks</td>
<td>2. Dietary risks</td>
</tr>
<tr>
<td>3. High LDL cholesterol</td>
<td>3. High LDL cholesterol</td>
</tr>
<tr>
<td>4. Air pollution</td>
<td>4. Air pollution</td>
</tr>
<tr>
<td>5. Tobacco</td>
<td>5. High body-mass index</td>
</tr>
<tr>
<td>6. High body-mass index</td>
<td>6. Tobacco</td>
</tr>
<tr>
<td>7. High fasting plasma glucose</td>
<td>7. High fasting plasma glucose</td>
</tr>
<tr>
<td>10. Other environmental risks</td>
<td>10. Other environmental risks</td>
</tr>
<tr>
<td>11. Alcohol use</td>
<td>11. Alcohol use</td>
</tr>
<tr>
<td>12. Low physical activity</td>
<td>12. Low physical activity</td>
</tr>
</tbody>
</table>

#### DALYs Due to High Systolic Blood Pressure in 2019 by Age

Roth, G.A. et al. J Am Coll Cardiol. 2020
Global Map of Age-Standardized DALYs Due to Hypertensive Heart Disease in 2019

GBD Study. J Am Coll Cardiol. 2020
Stroke incidence rates per 100 000 people, for both sexes, 2019
Prevalence of Hypertension in WHO regions

% raised blood pressure (SBP 140+ and/or DBP 90+ or on meds), ages 25+, age std

% of population

AFR, AMR, EMR, EUR, SEAR, WPR, Low income, Lower middle income, Upper middle income, High income

Men, Women, Both Sexes

WHO 2013
Geographic variation of hypertension in South Africa
Demographic & Health Survey, N=13,596

Hypertension prevalence = 30.4%
Women = 32.6%
Men = 27.4%

# Prevalence of Hypertension in LMICs

## Region

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Prevalence % (95% CI)</th>
<th>Number of studies</th>
<th>Heterogeneity % (95% CI)</th>
<th>Tau-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle East and North Africa</td>
<td>26.9 (19.3 to 35.3)</td>
<td>12</td>
<td>99.9 (99.9 to 99.9)</td>
<td>0.102</td>
</tr>
<tr>
<td>South Asia</td>
<td>29.4 (22.3 to 37.0)</td>
<td>70</td>
<td>100.0 (100.0 to 100.0)</td>
<td>0.474</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>31.1 (27.6 to 34.6)</td>
<td>74</td>
<td>99.6 (99.5 to 99.6)</td>
<td>0.108</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>31.5 (25.4 to 37.9)</td>
<td>12</td>
<td>99.7 (99.6 to 99.7)</td>
<td>0.056</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>35.7 (32.2 to 39.4)</td>
<td>33</td>
<td>99.8 (99.8 to 99.8)</td>
<td>0.049</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>39.1 (33.1 to 45.2)</td>
<td>41</td>
<td>99.7 (99.7 to 99.7)</td>
<td>0.162</td>
</tr>
</tbody>
</table>

## Overall prevalence = 32.3%

## Income

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Prevalence % (95% CI)</th>
<th>Number of studies</th>
<th>Heterogeneity % (95% CI)</th>
<th>Tau-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income</td>
<td>23.1 (20.1 to 26.2)</td>
<td>33</td>
<td>99.0 (98.9 to 99.1)</td>
<td>0.044</td>
</tr>
<tr>
<td>Lower middle-income</td>
<td>31.1 (26.1 to 36.4)</td>
<td>118</td>
<td>100.0 (100.0 to 100.0)</td>
<td>0.379</td>
</tr>
<tr>
<td>Upper Middle-income</td>
<td>37.8 (35.0 to 40.6)</td>
<td>90</td>
<td>99.8 (99.8 to 99.8)</td>
<td>0.077</td>
</tr>
</tbody>
</table>

## Residence

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Prevalence % (95% CI)</th>
<th>Number of studies</th>
<th>Heterogeneity % (95% CI)</th>
<th>Tau-squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>25.2 (20.9 to 29.8)</td>
<td>50</td>
<td>99.7 (99.7 to 99.7)</td>
<td>0.124</td>
</tr>
<tr>
<td>Urban</td>
<td>32.7 (30.4 to 35.0)</td>
<td>80</td>
<td>99.5 (99.5 to 99.5)</td>
<td>0.049</td>
</tr>
</tbody>
</table>
Prevalence of Hypertension in LMICs


Age

Education

Overweight/obesity
Special Issue: Current evidence and perspectives for hypertension management in Asia

Does the place of residence influence your risk of being hypertensive? A study-based on Nepal Demographic and Health Survey

Ishor Sharma¹ · M. Karen Campbell¹,²,³,⁴,⁵ · Yun-Hee Choi¹ · Isaac Luginaah⁶ · Jason Mulimba Were¹ · Juan-Camilo Vargas-Gonzalea¹ · Saverio Stranges¹,⁷,⁸,⁹,¹⁰

Fig. 1 Area level deprivation and hypertension prevalence in Nepal - NDHS-2016
Geographic Variation of Overweight/Obesity in Nigeria
2008 Demographic & Health Survey, N=29,967 women (15-49y)

Prevalence of combined overweight and obesity = 20.9%

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overweight/Obese (N=5,836)</th>
<th>Normal-weight (N=18,778)</th>
<th>P-value</th>
<th>Marginal OR &amp; 95%CI</th>
<th>Posterior OR &amp; 95% CR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean age (SD)</strong></td>
<td>31.3(6.6)</td>
<td>28.9(7.1)</td>
<td>P&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td>1808(15.7)</td>
<td>9730(84.3)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Primary education</td>
<td>1369(23.2)</td>
<td>4543(76.8)</td>
<td>1.15</td>
<td>1.03(1.28)</td>
<td>1.17(1.04, 1.32)</td>
</tr>
<tr>
<td>Secondary education</td>
<td>2009(34.1)</td>
<td>3881(65.9)</td>
<td>1.43</td>
<td>1.27(1.62)</td>
<td>1.49(1.32, 1.73)</td>
</tr>
<tr>
<td>Higher education</td>
<td>650(51.0)</td>
<td>624(49.0)</td>
<td>1.64</td>
<td>1.37(1.96)</td>
<td>1.68(1.38, 2.00)</td>
</tr>
<tr>
<td><strong>Place of residence</strong></td>
<td></td>
<td></td>
<td>P&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>3336(18.8)</td>
<td>14413(81.2)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Urban</td>
<td>2500(36.4)</td>
<td>4365(63.6)</td>
<td>1.24</td>
<td>1.14(1.35)</td>
<td>1.24(1.14, 1.36)</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Catholic</td>
<td>724(31.5)</td>
<td>1577(68.5)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Other Christian</td>
<td>2604(30.1)</td>
<td>6045(69.9)</td>
<td>0.77</td>
<td>0.68(0.88)</td>
<td>0.77(0.68, 0.89)</td>
</tr>
<tr>
<td>Islam</td>
<td>2372(18.2)</td>
<td>1066(81.8)</td>
<td>0.73</td>
<td>0.62(0.86)</td>
<td>0.74(0.63, 0.91)</td>
</tr>
<tr>
<td>Traditionalist</td>
<td>88(19.6)</td>
<td>360(80.4)</td>
<td>0.73</td>
<td>0.55(0.97)</td>
<td>0.75(0.58, 0.97)</td>
</tr>
<tr>
<td>Other</td>
<td>14(38.9)</td>
<td>22(61.1)</td>
<td>1.39</td>
<td>0.68(2.83)</td>
<td>1.49(0.68, 2.79)</td>
</tr>
<tr>
<td><strong>Wealth Index</strong></td>
<td></td>
<td></td>
<td>P&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poorest</td>
<td>718(12.0)</td>
<td>5279(88.0)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Richest</td>
<td>1709(47.5)</td>
<td>1891(52.5)</td>
<td>3.55</td>
<td>3.03(4.15)</td>
<td>3.45(2.98, 4.05)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Eko</td>
<td>67(16.7)</td>
<td>334(83.3)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Igala</td>
<td>99(31.5)</td>
<td>215(68.5)</td>
<td>8.15</td>
<td>4.52(14.7)</td>
<td>7.47(3.98, 12.3)</td>
</tr>
<tr>
<td>Igbo</td>
<td>1091(39.0)</td>
<td>1708(61.0)</td>
<td>7.03</td>
<td>4.22(11.7)</td>
<td>6.41(4.19, 10.4)</td>
</tr>
<tr>
<td><strong>State of residence</strong></td>
<td></td>
<td></td>
<td>P&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yobe</td>
<td>87(10.5)</td>
<td>741(89.5)</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Osun</td>
<td>82(19.3)</td>
<td>343(80.7)</td>
<td>0.64</td>
<td>0.44(0.95)</td>
<td>0.48(0.36, 0.61)</td>
</tr>
<tr>
<td>Cross River</td>
<td>133(24.2)</td>
<td>417(75.8)</td>
<td>4.49</td>
<td>2.80(7.19)</td>
<td>2.32(1.62, 3.40)</td>
</tr>
<tr>
<td>Lagos</td>
<td>357(50.2)</td>
<td>354(49.8)</td>
<td>1.68</td>
<td>1.23(2.30)</td>
<td>1.14(0.94, 1.37)</td>
</tr>
</tbody>
</table>
Urbanization & Geographic Variation of **Overweight/Obesity** in India 2005-2006 Demographic & Health Survey (DHS)

Urban areas consistently associated with a higher risk of overweight/obesity across all zones

Fertility as a key predictor of the double burden of malnutrition among women of child-bearing age in sub-Saharan Africa

Were JM, Stranges S, Creed IF. J Glob Health. 2020;10(2):020423
Features of cardiovascular disease in low-income and middle-income countries (LMICs) in adults and children living with HIV

McCrary, Andrew; Nduka, Chidozie; Stranges, Saverio; Bloomfield, Gerald

Changes in coronary heart disease mortality, in men and women aged 35–74, between 1990 and 2000

Capewell S, O’Flaherty M. Heart 2008;94:1105-1108
Explaining declining trends in CVD mortality in Western Countries

Circulation 2004;109:1101-7 & Heart 2013;99:159-62 & BMJ. 2014;348:g1088 (Scotland)
Fewer than 1 in 10 Canadian adults and 1 in 5 Canadian youth are in ideal cardiovascular health.
Influence of the Social Environment on Ideal Cardiovascular Health

Sarah S. Singh, MD, PhD, MPH; Saverio Stranges, MD, PhD; Piotr Wilk, PhD; Anthony S. L. Tang, MD; Stephanie J. Frisbee, PhD, MSc
End of the long-term decline in CVD mortality?

Cardiovascular disease death rates, Canada, 1980-2016

Global Burden of Disease Study, 2017-18
Hypertension Burden in Luxembourg
European Health Examination Survey (2013-15, age 25-64)

97'306 persons
31,03%

43'691 persons ignore their status

68'837 persons (>70%) ignore they suffer from hypertension or are not sufficiently controlled

Cardiovascular disease prevention in women: a rapidly evolving scenario

Sex-specific risk factors
- Premature menopause
- Gestational diabetes
- Hypertensive disorders of pregnancy
- Preterm delivery
- Polycystic ovary syndrome
- Systemic inflammatory and autoimmune disorders*

Well-established risk factors
- Hypertension
- Dyslipidaemia
- Diabetes
- Obesity
- Unhealthy diet
- Sedentary lifestyle
- Smoking or tobacco use

Under-recognised risk factors
- Psychosocial risk factors
- Abuse and intimate partner violence
- Socioeconomic deprivation
- Poor health literacy
- Environmental risk factors

The Lancet May 2021
Trends in Global Aging

Percent of Population Aged 65 & Over: History and UN Projection

Source: UN (2005)
Life expectancy

The period life expectancy\(^1\) at birth, in a given year.

Data source: UN WPP (2022); HMD (2023); Zijdeman et al. (2015); Riley (2005)
OurWorldInData.org/life-expectancy | CC BY

1. Period life expectancy: Period life expectancy is a metric that summarizes death rates across all age groups in one particular year. For a given year, it represents the average lifespan for a hypothetical group of people, if they experienced the same age-specific death rates throughout their whole lives as the age-specific death rates seen in that particular year. Learn more in our article: “Life expectancy” – What does this actually mean?
The World's Oldest Populations

Countries/territories with the highest share of people aged 65 and older*

<table>
<thead>
<tr>
<th>Region</th>
<th>2022</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>29.9%</td>
<td>Hong Kong</td>
</tr>
<tr>
<td>Italy</td>
<td>24.1%</td>
<td>South Korea</td>
</tr>
<tr>
<td>Finland</td>
<td>23.3%</td>
<td>Japan</td>
</tr>
<tr>
<td>Puerto Rico</td>
<td>22.9%</td>
<td>Italy</td>
</tr>
<tr>
<td>Portugal</td>
<td>22.9%</td>
<td>Spain</td>
</tr>
<tr>
<td>Greece</td>
<td>22.8%</td>
<td>Taiwan</td>
</tr>
<tr>
<td>Germany</td>
<td>22.4%</td>
<td>Greece</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>22.4%</td>
<td>Portugal</td>
</tr>
</tbody>
</table>

* only includes countries/territories with a population of more than 1 million people

Source: United Nations Population Division
There is no "typical" older person
Health and Functional Abilities in older age are not random

What makes us age differently?

Genetic inheritance

Who we are

and a lifetime of:

Where we live

Our health behaviour

Our access to health care
Integrated Life-Course Model of Ageing

Source: Kuh et al., 2014
Chronic Disease Continuum
Multimorbidity vs. Comorbidity

- **Co-Morbidity** = Index disease holds priority over any other co-occurring chronic diseases within an individual
  - Focus on a central disease that is of primary interest
  - Facilitates specialist and disease-centered approach

- **Multi-Morbidity** = Coexistence of multiple diseases within the same individual (typically defined as 2+ or 3+ chronic diseases)
  - One disease is not necessarily more central than the others
  - Facilitates more holistic and patient-centered approach

Source: Boyd and Fortin, 2010

COMMENTARY

Multimorbidity and comorbidity revisited: refining the concepts for international health research

Kathryn Nicholson\textsuperscript{a,b,*}, Tatjana T. Makovski\textsuperscript{c,d,e}, Lauren E. Griffith\textsuperscript{b}, Parminder Raina\textsuperscript{b}, Saverio Stranges\textsuperscript{a,c,f}, Marjan van den Akker\textsuperscript{d,g}
Multimorbidity Definition

Public Health Definition
- Alzheimer's Disease
- Anxiety or Mood Disorder
- Arthritis
- Asthma
- Cancer
- Chronic Obstructive Pulmonary Disease
- Diabetes
- Heart Disease
- Stroke

Primary Care Definition
- Anxiety or Depression
- Cancer
- Cardiovascular Disease
- Chronic Obstructive Pulmonary Disease or Asthma
- Colon Problem
- Diabetes
- Heart Failure
- Hypertension
- Kidney Disease or Failure
- Musculoskeletal Problem
- Obesity
- Osteoarthritis or Rheumatoid Arthritis
- Osteoporosis
- Stomach Problem
- Stroke or Transient Ischemic Attack
- Thyroid Problem
- Urinary Problem
Potential Drivers for Multi-Morbidity

- Unhealthy Diet
- Obesity
- Poly-Pharmacy
- Tobacco Use
- Disease Susceptibility
- Senescence
- Genetics
- Alcohol Use
- Low Education
- Family History
- Interaction Between Risk Factors
- Geographic Location
- Gender
- Ethnicity
- Sedentary Lifestyle
- Low Self-Efficacy
Review

Multimorbidity and quality of life: Systematic literature review and meta-analysis

Tatjana T. Makovski\textsuperscript{a,b,c,*}, Susanne Schmitz\textsuperscript{a}, Maurice P. Zeegers\textsuperscript{c}, Saverio Stranges\textsuperscript{a,d,e}, Marjan van den Akker\textsuperscript{b,f,g}
From the era of “single chronic disease medicine” to the era of “multimorbidity medicine”

The Importance of Multimorbidity & Aging

Source: OECD, 2011; WHO, 2015; Academy of Medical Sciences, 2018
Covid-19 Was America's Third Leading Cause Of Death In 2020

Number of deaths for all leading causes of death in the U.S. in 2020

<table>
<thead>
<tr>
<th>Cause</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>690,882</td>
</tr>
<tr>
<td>Cancer</td>
<td>598,932</td>
</tr>
<tr>
<td>Covid-19</td>
<td>345,323</td>
</tr>
<tr>
<td>Unintentional injuries</td>
<td>192,176</td>
</tr>
<tr>
<td>Stroke</td>
<td>159,050</td>
</tr>
<tr>
<td>Chronic lower respiratory diseases</td>
<td>151,637</td>
</tr>
<tr>
<td>Alzheimer disease</td>
<td>133,382</td>
</tr>
<tr>
<td>Diabetes</td>
<td>101,106</td>
</tr>
</tbody>
</table>

Source: Centers for Disease Control and Prevention
Distribution of the leading causes of death in Canada in 2020

- Malignant neoplasms: 26.4%
- Diseases of heart: 17.5%
- COVID-19: 5.3%
- Accidents (unintentional injuries): 5%
- Cerebrovascular diseases: 4.5%
- Chronic lower respiratory diseases: 3.8%
- Diabetes mellitus: 2.5%
- Alzheimer's disease: 1.9%
- Influenza and pneumonia: 1.9%
- Chronic liver disease and cirrhosis: 1.4%
- Nephritis, nephrotic syndrome and nephrosis: 1.3%
- Intentional self-harm (suicide): 1.2%
Covid-19 Cut Life Expectancy Short Around the World

Change in life expectancy in selected countries between 2019 and 2021 (in months)

- Norway
- Belgium
- Germany
- Spain
- England & Wales
- Chile
- United States
- Bulgaria

Differences in public health approaches could largely explain substantial variations in epidemiological indicators between Western and Eastern countries (e.g. Asia, etc.).

COVID-19 revealed vulnerabilities of most western countries' healthcare systems in their response to the ongoing public health crisis.

The lack of rapid and timely community-centered approaches and weak public health infrastructures resulted in a high number of cases/deaths in many western countries.

People may be less compliant with public health recommendations than in the East…
Uganda as a Role Model for Pandemic Containment in Africa

A comparison of COVID-19 epidemiological indicators in Sweden, Norway, Denmark, and Finland

MORTALITY (Jan 28/2021)
1,137 x 1M (Sweden)
357  x 1M (Denmark)
120  x 1M (Finland)
102  x 1M (Norway)
Excess mortality from COVID-19: a commentary on the Italian experience

Paolo Pasquariello¹ • Saverio Stranges²,³,⁴
Small steps, strong shield: directly measured, moderate physical activity in 65,361 adults is associated with significant protective effects from severe COVID-19 outcomes.

The World Health Organization has defined Long COVID as a condition that occurs in those with probable or confirmed COVID-19 infection where symptoms last for at least two months from the onset of the infection (2022).

COVID-19: Lasting impact

Even those survivors with mild initial cases can have widespread health issues for six months or more.

WashU researchers link many diseases with COVID-19, signaling long-term complications for patients and a massive health burden for years to come.

- **Cardiovascular**
  - acute coronary disease, heart failure, palpitations, arrhythmias

- **Respiratory system**
  - cough, shortness of breath, low blood oxygen

- **Kidney**
  - acute kidney injury, chronic kidney disease

- **Musculoskeletal**
  - joint pain, muscle weakness

- **General**
  - malaise, fatigue, anemia

- **Mental health**
  - anxiety, depression, sleep problems, substance abuse

- **Nervous system**
  - stroke, headaches, memory problems, smell problems

- **Metabolic/endocrine**
  - obesity, diabetes, high cholesterol

- **Gastrointestinal**
  - constipation, diarrhea, acid reflux

- **Skin disorders**
  - hair loss, rash

- **Coagulation disorders**
  - blood clots
COVID-19 & One-Health concept

Relevance of human, animal, & environment interaction to viral disease based on One-Health concept

Asif Z, Chen Z, Stranges S, et al. Sustainable Cities and Society 2022
Global Vaccine Equity to End the COVID-19 Pandemic: A Canadian Perspective and Call to Action

Michael Clarke¹, Shehzad Ali¹,²,³, Michael Silverman²,⁴ and Saverio Stranges²,⁵,⁶,⁷

Canadian Journal of Public Health
https://doi.org/10.17269/s41997-022-00706-9

SPECIAL SECTION ON COVID-19: LETTER TO THE EDITOR

COVID-19 vaccine inequity and Big Pharma: time to rethink our love affair?

Shehzad Ali¹,²,³,⁴,⁵ - Ayesha Jacub⁶ - Saverio Stranges¹,⁷,⁸
COVID-19 and inequality: are we all in this together?

Shehzad Ali \(^1,2\) · Miqdad Asaria \(^3\) · Saverio Stranges \(^1,4,5\)

The syndemic of COVID-19, non-communicable diseases (NCDs) and social determinants of health (from Singer, Dahlgren, and Whitehead)

*J Epidemiol Community Health* 2020;74:964-968
Harms of public health interventions against covid-19 must not be ignored

The harmful consequences of public health choices should be explicitly considered and transparently reported to limit their damage, say Itai Bavli and colleagues

Itai Bavli, 1, 2 Brent Sutton, 3 Sandro Galea 4

Ethics of COVID-19-related school closures

Michael Silverman 1,2 Bob • Robert Sibbald 3 • Saverio Stranges 2,4,5
Infodemics and health misinformation: a systematic review of reviews

Israel Júnior Borges do Nascimento,ª Ana Beatriz Pizarro,ª Jussara M Almeida,ª Natasha Azzopardi-Muscat,ª Marcos André Gonçalves,ª Maria Björklundª & David Novillo-Ortizª
Lessons Learned from the Pandemic

✓ Health care systems in Western countries are primarily designed to manage chronic disease (need for larger investments in epidemic preparedness)

✓ Public health responses play a crucial role in the mitigation of COVID burden

✓ Capitalize on new data and technology to facilitate proactive case identification as done in some Asian countries (S Korea, Taiwan, Japan, etc.)

✓ Communication with the public is crucial to offset misinformation & fake news

✓ International partnerships and share of data have been lacking

✓ Side-effects of restrictive measures such lockdowns (low SES, children, etc.)

✓ The pandemic has been widening health disparities around the world