HKUMed joins *Lancet* Commission to call for international collaboration and multidisciplinary action to reduce sudden cardiac deaths

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Tackling SCD requires a clinical multidisciplinary approach with international research collaboration
A Major Public Health Issue

249,538 SCD cases per year in EU
Estimated global burden
About 4 to 5 million every year

Structural Non-Ischaemic (dilatation, hypertrophy, scar replacement)
Genetic (HCM, DCM, ARVC, myopathies) or acquired (myocarditis)

Aetiology for Sudden Cardiac Death

- Coronary Artery Disease
  - Acute ischaemia or myocardial infarction
  - Chronic scar-related arrhythmia

A MODE OF DEATH – NOT A DISEASE!!!

Empana JP, et al. JACC 2022
No Significant Temporal Changes in SCD Burden

Incidence Per 100,000 Person-Years

2010: 36.8
2011: 39.3
2012: 38.6
2013: 39.7
2014: 39.1
2015: 39.1
2016: 39.1
2017: 39.1
2018: 39.1
2019: 39.1

Empana JP, et al. JACC 2022
SCD in Hong Kong

- HK Fire Service Department
- Prospective registry of patient demographics, time, date, circumstances of discovery, rhythm at discovery, resuscitation process and outcomes
- HK Forensic Pathology service
- Prospective registry of patient demographics, time, date, circumstance of victim discovery, autopsy findings and causes of death
- CMS to review individual data
- 1 Jan 2014 to 31 Dec 2016
- Excluded unnatural causes
- Strictly adhere to the definition of sudden death

77.4 ± 15.7 years, and 7718 (55.1%) were male

Hai JJ, Tse HF. Unpublished data
SCD in Hong Kong

- The crude rates of SCD / SCA in the male, female, and the entire Hong Kong populations were **40, 22 and 31 per 100,000 population-years**.

Hai JJ, Tse HF. Unpublished data
SCD in Hong Kong

<35 Years old

- ACS 24%
- CAD 21%
- Unknown 15%
- DCM 10%
- Myocarditis 5%
- ARVD 2%
- HCM 2%
- CHD 3%
- VF 2%
- VHD 2%

45% CAD/ACS

>=35 Years old

- ACS 23%
- CAD 44%
- HTHD 19%
- DCM 2%
- Myocarditis 5%
- ARVD 2%
- HCM 2%
- CHD 3%
- VF 2%
- VHD 2%

67% CAD/ACS

Hai JJ, Tse HF. Unpublished data
Strengthening current autopsy practices in suspected SCDs can provide crucial data needed for at-risk families.
Although it’s known the majority of SCDs are caused by coronary artery disease, there are major gaps in our ability to predict people’s risk of coronary artery disease and SCD.

→ More researches (genetic, big data and AIs) are required to identify potential indicators of high-risk individuals.
A Very Particular Mode of Death

Marijon E, ... Tse HF, et al. Lancet 2023

RESUSCITATION
Increasing survival rate

< 10% survival rate

Reversible Death
Non-Reversible Death

SCA
SCD
To Decrease SCD Burden

**PREVENTION**
Decreasing the occurrence

**RESUSCITATION**
Increasing survival rate

SCA  SCD

Marijon E, ESC 2023
Modifiable Risk Factors for CAD

Population-attributable fractions of 10-year CVD for single risk factors and geographic region

Overall cardiovascular disease prevention and emphasis on a healthy lifestyle (healthy diet, exercise, and quitting smoking) and risk factors control (blood pressure and lipid) would lead to reductions in SCD incidence.

Magnussen C, NEJM 2023

Marijon E, ...Tse HF, et al. Lancet 2023
Survival from sudden cardiac arrest depends on a time-sensitive sequence called “the chain of survival”.

This involves (1) immediate recognition of SCA and activation of an emergency response, (2) high-quality CPR, (3) rapid defibrillation, (4) advanced resuscitation, (5) post cardiac-arrest care and (6) rehabilitation and recovery.
- Frequency community CPR training using innovative strategies like apps, social media, large group-based events, virtual skills practice can improve community awareness and response.

- Redesigning delivery of automatic external defibrillators (AEDs) will improve defibrillation success in the community.
Risk and Benefit of Sport Activity

Marijon E, ...Tse HF, et al. Lancet 2023