Cardiovascular Disease in Russia
Towards a 360° assessment

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Good News

Cardiovascular mortality rates in Russia have been declining since mid-2000s
but ....

Russia still has one of the highest cardiovascular mortality rates in the world
Cardiovascular mortality trends 1970-2014 in males by country

Cerebrovascular disease

Ischaemic heart disease

Source: Andreev & WHO HFA
Cardiovascular mortality trends 1970-2014 in females by country

Cerebrovascular disease

Ischaemic heart disease

Source: Andreev & WHO HFA
Two simple questions

• What is the explanation for Russia’s very high and fluctuating cardiovascular mortality?
• What can be done about it?
International Project on Cardiovascular Disease in Russia (IPCDR) 2014 - 2019

Funded by
Project launch meeting
Moscow 2-3 June 2014
Objectives of IPCDR

• To explain the poorly understood but extremely high rates of premature mortality from cardiovascular disease (CVD) in Russia
• To communicate results effectively so as to improve primary and secondary prevention of CVD in Russia
• Broaden aetiological understanding of CVD worldwide
Logic of IPCDR

Why does Russia have one of highest CVD mortality rates in world?
Logic of IPCDR

Differences in the way cause of death is certified and/or coded

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Differences in level of main risk factors for CVD
Logic of IPCDR

- Differences in the way cause of death is certified and/or coded
- Unacknowledged CVD risk factors
- Differences in level of main risk factors for CVD
- Why does Russia have one of the highest CVD mortality rates in the world?
Logic of IPCDR

Why does Russia have one of highest CVD mortality rates in world?

- Differences in the way cause of death is certified and/or coded
- Unacknowledged CVD risk factors
- Differences in profile of CVD structure and function
- Differences in level of main risk factors for CVD
Logic of IPCDR

Medical detection and treatment of CVD risk factors

Differences in the way cause of death is certified and/or coded

Unacknowledged CVD risk factors

Differences in profile of CVD structure and function

Differences in level of main risk factors for CVD

Why does Russia have one of highest CVD mortality rates in world?
Logic of IPCDR

- Differences in the way cause of death is certified and/or coded
- Unacknowledged CVD risk factors
- Differences in profile of CVD structure and function
- Differences in level of main risk factors for CVD
- Medical detection and treatment of CVD risk factors
- Treatment of acute events and subsequent secondary prevention

Why does Russia have one of highest CVD mortality rates in world?
A 360° assessment

Medical detection and treatment of CVD risk factors

Differences in the way cause of death is certified and/or coded

Unacknowledged CVD risk factors

Differences in profile of CVD structure and function

Differences in level of main risk factors for CVD

Why does Russia have one of highest CVD mortality rates in world?
Four themes

**Theme 1**: Validity of cause of death (coding, autopsy and other studies)

**Theme 2**: Levels and trends in cardiovascular mortality and associated risk factors (synthesising existing routine and research data)

**Theme 3**: Understanding the nature and causes of cardiovascular disease in Russia (aetiological studies)

**Theme 4**: Barriers, opportunities and capacity for improved prevention and treatment (role of *health sector*)
Theme 1

• Content: Series of comparative studies of validity of cardiovascular cause of death in Russia and Norway, involving medical and forensic experts and statistical organisations in both countries

• Leader: Per Magnus (Norwegian Institute of Public Health)
Theme 1 - Status

• Bench marking of coding using existing Nordic-Baltic methodology completed and being analysed
  – 350 death certificates from Nordic countries coded in Arkhangelsk (by >20 specialists)
  – 350 death certificates from Arkhangelsk coded in Norway

• Analyses underway looking at influence of certifying expert (forensic vs other) on cause of death

• Analyses underway of detailed distribution by cardiovascular cause of death (ICD10 3 and 4-digit level) in Russia vs other countries

• Small-scale study of sudden unexpected deaths subject to forensic autopsy in Arkhangelsk, Tromso and Oslo completed
Theme 2

- **Content**: Synthesis of existing routine and research data from Russia to provide best possible assessment of risk factors and their relationship to mortality variation, and their comparison with other countries.

- **Leader**: Vladimir Shkolnikov, Higher School for Economics, Moscow & Max Planck Institute Demographic Research, Germany.
Theme 2 - status

• Pooled data set of national and local studies assembled
  – Smoking: analyses of socio-demographic differences (14 studies, 155,013 individuals, aged 18-79) and of time trends in (RLMS 1985-2015; 123,919 observations)
  – Next step will be analyses of biomarkers (hypertension, lipid profiles, obesity)

• Ongoing analyses of national and regional mortality data

• Travel time to PCI centres analysed for RF as a whole in collaboration with Theme C
Theme 3

- **Content**: Cross-sectional surveys of random sample men and women aged 35-69 years including cardiovascular structure, function and bio-markers in Novosibirsk and Arkhangelsk

- **Leader**: Sofia Malyutina (Institute Internal Medicine, SB RAMS and Novosibirsk State Medical University)
Core activities of Theme 3

• In-depth phenotyping of cardiac and vascular structure and function and biomarkers, using state-of-the-art methods
• Measurement of functional markers, behaviours, socio-demographic factors and risk markers
• Assessment of association of these parameters in the study population
• Comparison of phenotypes and associations with Tromsø 7 Study in Norway and other studies
Survey Procedure

Levada Centre and its local survey companies

Study Team

Novosibirsk
- Random sample of home addresses visited by experienced interviewers
- Interviews completed and health checks booked
- Reminder about health check
- 2175 health checks (majority in polyclinic)

Arkhangelsk
- Random sample of home addresses visited by experienced interviewers
- Interviews completed and health checks booked
- Reminder about health check
- 2175 health checks (majority in polyclinic)
# Cardiovascular phenotypes

<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Biomarker/proxy measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atherosclerosis</td>
<td>Questionnaire</td>
<td>Previous MI</td>
</tr>
<tr>
<td></td>
<td>Cardiax digital ECG</td>
<td>Evidence previous MI</td>
</tr>
<tr>
<td></td>
<td>Carotid ultrasound (GE Vivid Q)</td>
<td>Carotid IMT, plaque</td>
</tr>
<tr>
<td>Cardiac remodelling</td>
<td>Blood sample</td>
<td>NT-pro BNP, hsTnT</td>
</tr>
<tr>
<td></td>
<td>Echocardiography (GE Vivid Q)</td>
<td>Myocardial function and size</td>
</tr>
<tr>
<td></td>
<td>Cardiax digital ECG</td>
<td>LVH</td>
</tr>
<tr>
<td>Vascular dysfunction</td>
<td>Vicorder</td>
<td>Pulse-wave velocity</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>Omron 705 IT</td>
<td>Blood pressure</td>
</tr>
</tbody>
</table>
Theme 3 – status

• By early-September 2017 recruited and examined 91% (3975) of our target of 4350 men and women aged 35-69 years (2250 Arkhangelsk; 1725 Novosibirsk)
• Repeatability study underway (target = 200 subjects in each city)
• Examination of patients with alcohol problems in Arkhangelsk almost completed (target=250)
• Projected completion fieldwork late Autumn 2017
• Biochemical assays to be completed in Spring 2018
IPCDR
Russia-Norway comparisons particularly important
Heart to Heart
Tromsø, Arkhangelsk and Novosibirsk

Troms, Norway (2015-16)
21,000 men and women, > 40 years

Arkhangelsk, Russia (2015-17)
2,200 men and women, 35-69 years

London, UK (2014-19)
Project partner

Novosibirsk, Russia (2015-17)
2,200 men and women, 35-69 years
Heart to Heart
Tromsø, Arkhangelsk and Novosibirsk

Aim: to learn and benefit from studying differences in cardiovascular health in IPCDR and the Tromsø Study
Associations: Analytic framework

Endogenous exposures: a priori CVD risk biomarkers
(including lipoprotein NMR profile)

CVD phenotypes

Socio-demographic +
exogenous exposures

Metabolic profile
Microbiome

Studies in other countries
eg Tromsø 7
Theme 4

• **Content**: Studies of health sector and treatment issues that might contribute to high CVD mortality drawing on other international comparative studies

• **Leader**: Martin McKee (London School of Hygiene & Tropical Medicine), coordinated by Anna Kontsevaya (National Research Centre Preventive Medicine, Moscow)
Theme 4 – Status (1)

Study of treatment of acute MI

– 13 regions (16 hospitals) with 1131 patients recruited on admission, with follow-up at 6 and 12 months proceeding

– Fieldwork to end autumn 2017
Theme 4 – Status (2)

- CVD medications availability and affordability study in 6 regions started
- Reviews of health care governance and quality management underway: commissioned from Sergey Shiskin at Higher School for Economics, Moscow
- Analyses of avoidable mortality planned
- Study of management of hypertension in primary care using discrete choice experiment
Some preliminary results
Rates of percutaneous coronary intervention (stenting) for acute myocardial infarction

Rates of PCI 2013

Kontsevaya et al. in press
IPCDR Themes

1/2 Differences in the way cause of death is certified and/or coded

Medical detection and treatment of CVD risk factors

Treatment of acute events and subsequent secondary prevention

Unacknowledged CVD risk factors

Differences in profile of CVD structure and function

Differences in level of main risk factors for CVD

Why does Russia have one of highest CVD mortality rates in world?
Getting policy engagement in Russia

• Presentations at conferences and symposia such as Russian Society of Cardiology annual meeting (St Petersburg, October 2017)
• Workshops at regional and federal level with Ministry of Health
• Using IPCDR to catalyse development of comprehensive strategy for CVD that incorporates all sides – a challenge!
Access to IPCDR data

• Sharing data is good for science and public health
• Any legitimate researcher will be able to obtain subsets of the data collected by IPCDR
• We are developing a transparent and open mechanism for applying for access to the data
  – Clear description of what is available (meta-data web-site)
  – Application process clearly defined
Thanks

• To all the participants who are taking part in the studies !
• And to everyone working on the study (>120)
Спасибо