„DATA“ AS ONE OF THE IMPORTANT CHALLENGE FOR AIR POLLUTION HEALTH ASSESSMENT IN SERBIA

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Webinar 2: Status of air quality & health data streams – accessibility and usability across SE Europe
7 000 000 deaths each year

FACT:
23% of all global deaths are linked to the environment.
That's roughly 12.6 million deaths a year.

WHERE IS IT HAPPENING?
3.8 million in Eastern Asia Region
3.5 million in Western Pacific Region
2.2 million in Africa Region
1.4 million in European Region
854 000 in Eastern Mediterranean Region
847 000 in the region of the Americas

AIR POLLUTION
790,000 excess deaths due to ambient air pollution per year in Europe

Air Pollution
Tobacco
Dietary risks
Air pollution
Fasting plasma glucose
High body-mass index
Kidney dysfunction
Malnutrition
Alcohol use

World Health Organization
#EnvironmentalHealth

Air pollution including outdoor and indoor
THE LATEST DATA: EVERYONE (ALMOST) IS EXPOSED!

AIR POLLUTION

PROVIDED EVIDENCE BASED ON DATA

HEALTH EFFECTS

9 out of 10 people in cities breathe polluted air.

92% 2016

99% 2019

Air pollution affects people throughout their lifetime

Pregnancy

- low birth weight

Children

- asthma
- slower development of lung function
- development problems
- more wheezing and coughs

Adults

- asthma
- coronary heart disease
- stroke
- lung cancer
- chronic obstructive pulmonary disease (as chronic bronchitis)
- diabetes

Elderly

- asthma
- accelerated decline
- lung function
- lung cancer
- diabetes
- dementia
- heart attack, heart failure and strokes

The researcher must consider ........

**Sources**
- Mass concentration PM$_{2.5}$
- Chemical composition PM$_{2.5}$

**Individual exposure**
- Time of exposure
- Ratio "concentration - dose"

**Health effects**
- The way of breathing
- Volume of inhaled air
- Presence of respiratory diseases
- Physical activity
- Years of life

Air pollution exposure is **must have data**

Public health aspect

Individual health indicators during time

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**Time series study**
(Health outcome as event)

**Cohort study**
(Health outcome is in function of time)

Evi Samoli, "Epidemiological designs to study the effects of short- and long-term exposure to air pollution", Virtual Workshop on Air Pollution and Health in Southeast Europe, 2021 June 8th.
Automatic air quality monitoring in real time from **national network** and **local networks** in Vojvodina, Pancevo and Belgrade.
Air quality „data sets“

Open data (SEPA)
Source: http://data.sepa.gov.rs/dataset

Annual air quality report in some of the local self-government
(e.g. Local authority for environmental City of Novi Sad)

Annual air quality report in Serbia (SEPA)
Source: http://www.ekourbapv.vojvodina.gov.rs/rs/

Reports on the state of environment in Autonomous Province of Vojvodina
(Provincial Secretariat for Urbanism and Environmental Protection, Autonomous Province of Vojvodina)
Source: https://environovisad.rs/monitoring/23

Publicly available data:

- Annual data
- Daily data (only several (presented with graph))
- Hourly data (SEPA)

City of Novi Sad (2nd largest city in Serbia)

Spatial distribution

Temporal distribution

Availability of data

Frequency of PM$_{10}$, PM$_{2.5}$ measure

Source: http://data.sepa.gov.rs/dataset

Source: https://environovisad.rs/monitoring/23

Source: http://data.sepa.gov.rs/dataset

Source: http://www.ekourbapv.vojvodina.gov.rs/rs/

Source: https://environovisad.rs/monitoring/23
HEALTH DATA

- EHIS indicators
- Methodological approach: interview, questionnaire and measurement of basic anthropometric characteristics
- Change in research methodology in 2013 and 2019
- At the level of the Republic and four statistical regions with the type of area (urban and other)
- Health status, personal characteristics of respondents, health-related behavior and use of health care

HEALTH SURVEYS are a good starting point for monitoring the health status of a population

Source: https://www.stat.gov.rs/en-us/publikacije/publication/?p=13005
HEALTH STATISTICAL YEARBOOK OF REPUBLIC OF SERBIA

1. STANOVNISTVO I VITALNA STATISTIKA
   POPULATION AND VITAL STATISTICAL DATA

2. ZDRAVSTVENE USTANOVE I KADROVI
   HEALTH CARE INSTITUTIONS AND STAFF

3. ZDRAVSTVENA ZAPITTA NA PRIMARNOM NIVOJU
   PRIMARY HEALTH CARE SERVICE

4. STACIONARNA ZDRAVSTVENA ZAPITTA
   INPATIENT HEALTH CARE

5. ZARAZNE BOLESTI
   COMMUNICABLE DISEASES

6. NERAZAZNI POREMEČAJI ZDRAVLJA
   NON-COMMUNICABLE DISEASES

7. POROBAJ I PREKIDI TRUDNOB
   BIRTHS AND ABORTIONS

8. JIVOTNA CREDINA I ZDRAVLJE
   ENVIRONMENT AND HEALTH

9. STIL JIVOTA, ZNAJA I STAVOVI PREMA ZDRAVLJU
   LIFE STYLE, KNOWLEDGE AND ATTITUDES TO HEALTH

   Population, births and deaths in Republic of Serbia, 2014–2018

1.5. Desev najčešćih uzroka smrti prema dijagnozi, polu i dobim grupama u Republici Srbiji, 2018.
   Ten most common causes of death by disease, sex and age groups in Republic of Serbia, 2018

   Number of deaths from leading non-communicable diseases by sex, Republic of Serbia, 2009–2018

   6.3. Broj novokupljenih osoba i inicijalizacija od akutnog koronarnog sindroma, prema okružju i regionima u Republici Srbiji, 2017. godina
   Number of new cases and acute coronary syndrome incidence rates by district and regions, Republic of Serbia, 2017
The Law on Health Documentation and Records in the Field of Health


- The Rulebook on Resources for Keeping Records in the Area of Healthcare ("Official Gazette of RS", No.123/14, 106/15, 105/17 and 20/19)

Secondary sources of information:
- Electronic medical records,
- Private offices/clinics,
- Drug dispensing records of pharmacies,
- Social Security Fund,
- Hospitals and Coronary units,
- Emergency Service.....

Source: https://www.stat.gov.rs/en-US#
2010–2015

AirQ+ software (Use Risk Estimates)

PM$_{2.5}$ exposure (PM$_{10}$ converted)

3600 premature deaths (in 11 studied cities)

Nearly 6400 premature deaths for whole country (urban areas)
Different air quality regulation means different AQI: misinterpretation

One of the Solution: Local AQI City of Novi Sad

- Based on the National Law
- WHO guidelines
- More than 10 Epidemiological research in Novi Sad as an administrative cohort (mortality, respiratory and cardiovascular morbidity, lung cancer, acute respiratory infection, pneumonia)
- Interactive map (comparable to other AQI) to decreased misinterpretation

Other reasons for misinterpretation???
AIR POLLUTION AND HEALTH: DATA AS IMPORTANT TOOL!

- More available
- Spatial covered
- Temporally covered

- Regulatory framework exists
- Capacity building is needed
- Central data sets that brings together national and local monitoring air quality data
- Local monitoring network - carefully planned and harmonized with national - exposure estimates

- Improving existing health data collection routines in primary healthcare, hospitals and ER (with respect of confidentiality)
- Fill the gap - harmonized database - resource for HRA / HIA
- Real time data is important for communication
- Intersectional cooperation network
- Knowledge cooperation
THANK YOU!

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