



HOW DO DIFFERENT SOURCES CONTRIBUTE TO POPULATION EXPOSURE TO KEY POLLUTANTS IN SERBIA

Branislava Matić-Savićević, M.D., PhD

Institute of Public Health of Serbia

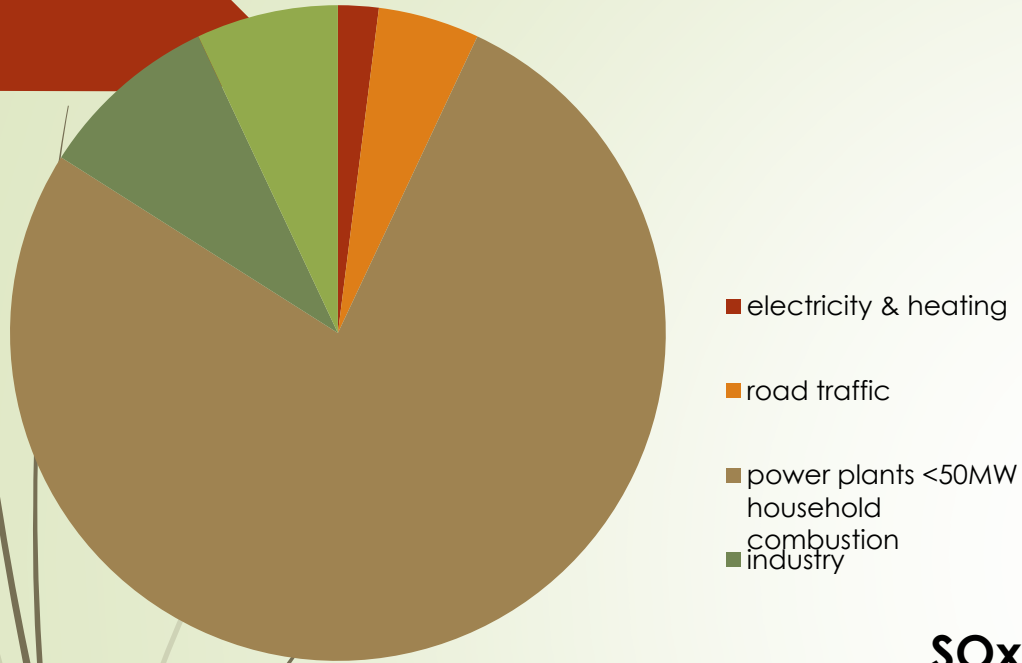
09.06.2021. HEI webinar

Sources of air pollution of public health concern in Serbia

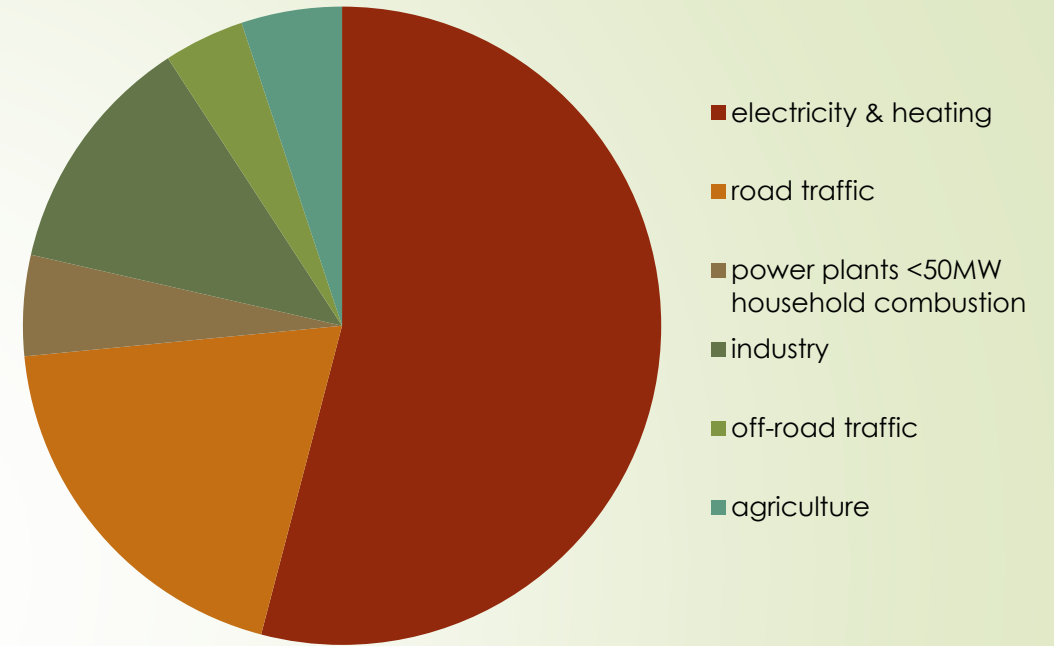
- Energy sector: lignite-burning power plants, open pit mines (lignite), waste ash landfills, oil refineries
- Mining, milling & smelting (Cu, Pb, steel plant)
- Bor mining-milling complex (expanding tendency): SO₂, As, Cd
- Household fossil fuel combustion
- Traffic; underdeveloped road infrastructure (indirect impact)
- Municipal waste dumping sites
- Cement plants: cement production + burning municipal waste in kilns



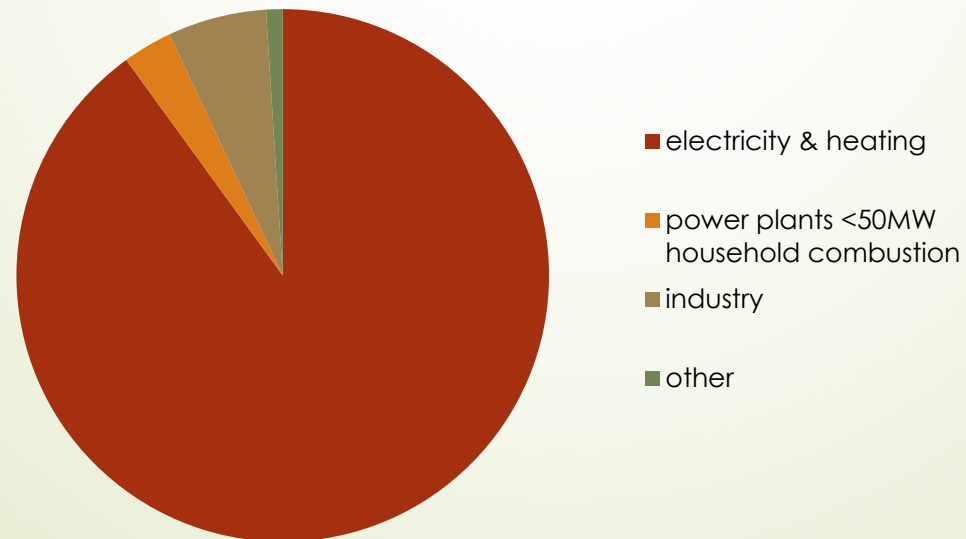
sources of PM_{2.5} (%)



NOX sources (%)



SOx sources (%)



AQ monitoring networks and stakeholders



- > 60 measuring points
- National Network of AMSs: 37 automatic measuring stations (SEPA)
- 33 air sampling sites – 17/25 local IPHs (contracts with the MoEP)
- Local governments: contracting with IPHs and other licenced stakeholders – Local Network for AQ monitoring

monitoring presence of pollutants in ambient air:

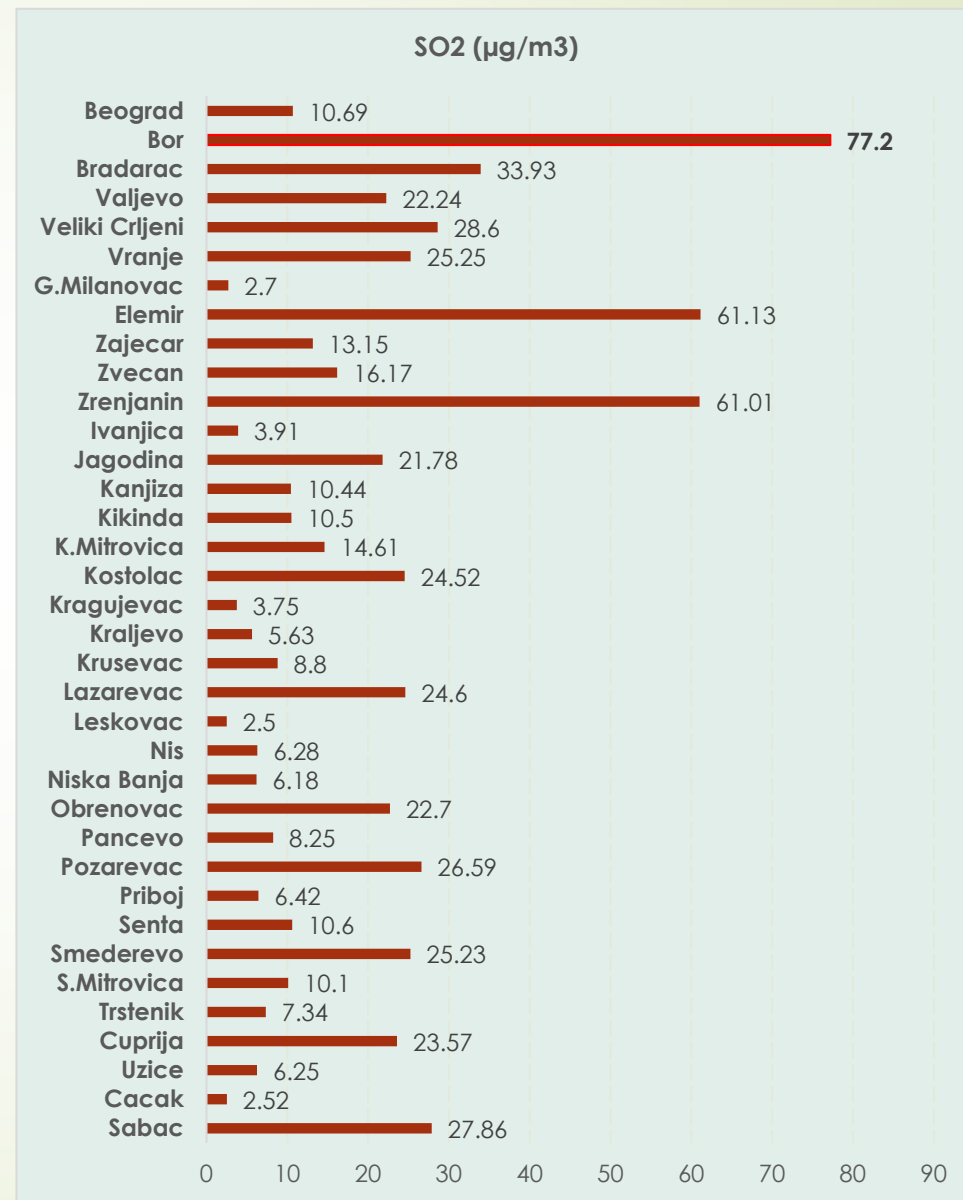
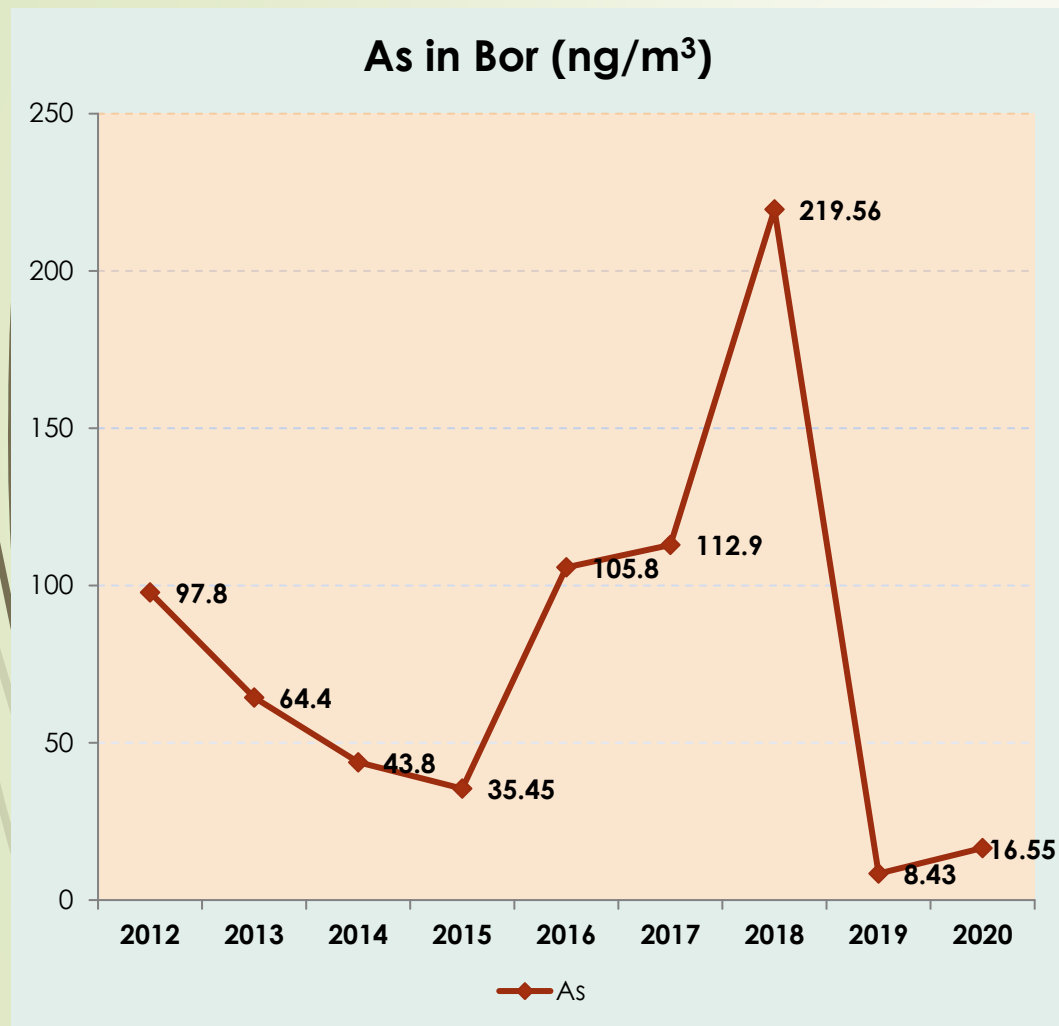
- SO_2 , NO_2 ,
- PM_{10} , heavy metals in PM_{10} (As, Pb, Cd, Ni)
- $PM_{2.5}$
- VOCs: benzene, toluene, xylene; B(a)P,

Existing data bases in Serbia

Health information system	Air quality data
<p>Data from the primary and secondary level of health care for:</p> <ul style="list-style-type: none">• <i>Asthma bronchiale</i>• <i>Bronchitis/bronchiolitis acuta</i>• <i>COPD</i>• <i>Infarctus myocardii</i> <p>National Registers: cancer, acute coronary syndrome, diabetes (IPHS)</p>	<ul style="list-style-type: none">• SEPA – State network of Automatic measuring stations (AMS)• Measuring stations heald by local IPHs• Measurements contracted by the local selfgovernments with other legal entities• Bor Institute of Mining and Metallurgy

Monitoring of indoor air quality is not legally regulated, but the results are obtained at the project level, in accordance with the stated needs.

exceeding limit values of pollutants in Bor



Impact of continuously polluted environment on health- Bor study

IMPROVING CONTAMINATED SITES MANAGEMENT IN SERBIA

"Strengthening Serbian national capacities
and inter-sectorial synergies for
safe management of contaminated sites
and related hazardous substances
to prevent negative impact on
human health and the environment"
Project No.: QSPTF/13/13/GOV/19



Republic of Serbia
MINISTRY OF HEALTH



INSTITUTE OF PUBLIC HEALTH OF SERBIA
"Dr. Milan Jovanović Batković"



Republic of Serbia
MINISTRY OF
ENVIRONMENTAL PROTECTION

- Project: „*Strengthening Serbian national capacities and inter-sectorial synergies for safe management of contaminated sites and related hazardous substances to prevent negative impact on human health and the environment*”, Project No.: QSPTF/13/13/GOV/19
- Supported by: WHO, UNEP, SAICM, Istituto Superiore di Sanita
- Implementation agency: IPHS
- Partners: MoEP, SEPA
- retrospective epidemiological study (2000-2015)
- population coverage: Town of Bor + 4 neighbouring municipalities
- referent population: SE Serbia
- 35 cancer localities
- data base: National Cancer Register
- Project realization - 2018

Key project outcomes

For the first time applied The epidemiological method S.E.N.T.I.E.R.I. (Istituto Superiore di Sanita) for quantifying the incidence of cancer depending on the residential address, versus stationary source of pollution

- ▶ **For all malignant tumors except skin tumors, there is a significantly higher risk of acquiring disease in both men and women.**
- ▶ This pattern is observed for specific sites of cancer localization, including **cancer of the colon and rectum, pancreas, kidney, bladder, thyroid, lymphopoietic tissue, Hodgkin's and non-Hodgkin's lymphoma, leukemia, and mesothelioma.,**
- ▶ **and a significantly higher risk of lung cancer** was registered in both men and women in Bor
- ▶ **For all malignant tumors except skin tumors, a significantly higher risk of dying was observed in both men and women in Bor.**
- ▶ **this pattern is observed for mortality:** cancer of the bronchi and lungs, liver, pancreas, melanoma, bladder, lymphopoietic tissue, non-Hodgkin's lymphoma and myeloid leukemia.
- ▶ **Analysis of Mt** for all causes of death, death due to diseases of the circulatory system, respiratory, digestive and urogenital diseases: **it was noticed that there is a higher risk of mortality in Bor in almost all groups in both men and women.**
- ▶ **A higher risk of dying in both sexes was registered for all diseases and disorders,** diabetes mellitus, diseases of the circulatory system, diseases of the respiratory system, as well as for congenital deformities, malformations and chromosomal aberrations.

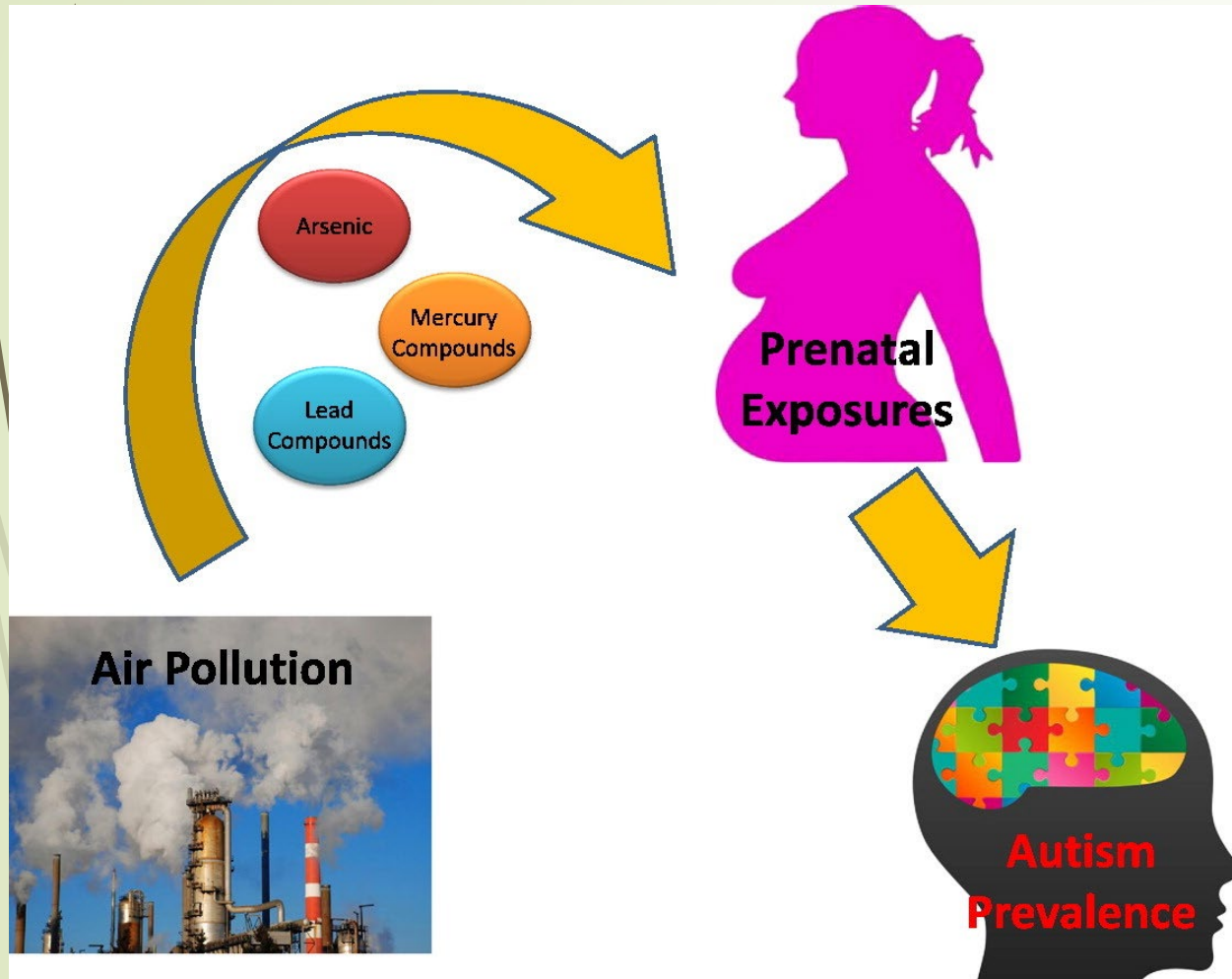
Planning Further steps – The Road map document

- Improve monitoring and data analysis, using modern analytical methods: application of AIR Q plus WHO software to approximate the impact of air pollution by certain pollutants (SO₂, NO₂, PM₁₀, PM_{2.5}, ...)
- **for each local self-government**, in accordance with the law, **define key sources of pollution**
- **define types of pollution monitoring**
- **improve the methodology for assessing the impact of chemicals on health**, in line with WHO recommendations
- for industrially contaminated sites with significant **long-term pollution of all environmental media**, determine methods of **human biomonitoring**, in accordance with the dominant pollutant (arsenic, lead, cadmium)
- key stakeholders: MoH, IPHS + Network of local IPHs and towns/municipalities: Bor, Pančevo, Smederevo, Kosjerić, Kostolac, Obrenovac, Lazarevac
- Strengthen the civil sector to be actively involved in addressing the issue of pollution impact assessment on health, educational and project

The role of the National IPH in proposed activities

- ▶ Since 2018 IPHS has been involved in WHO-supported activities on the issue of involving health sector in chemicals management, producing relevant multisectoral documents:
 1. **Road map for sound intersectoral management of contaminated sites** (2018)
 2. Project: **Development of a road map to enhance health sector engagement/contribution to sound chemicals management in Serbia till 2030** (February-March 2021)
 3. Project: **Strengthening of national capacities for assessment of chemicals risks to guide risk reduction decisions** (June- November 2021)
- ▶ To review and update national methodological documents on chemicals RA (individual chemicals and combined risks) and to develop proposals for infrastructure development based
- ▶ To prioritize chemicals present in all environmental media for further assessment of risks (AIR Q+, SENTIERI..)
- ▶ To map health risks of 1-2 chemicals to demonstrate benefits of RA for decision-making

Why mention „chemicals“?



- transplacental migration
- neurodevelopmental, cognitive disorders in newborns
- carcinogenic effects in adult population
- haematotoxic
- respiratory diseases
- endocrine disrupting compounds (Pb, As, POPs)



Thanks for attention!