



## Oxidative Potential : A New Perspective of Air Pollution Health Effects

PHD PROGRAMME IN ENVIRONMENT ENGINEERING

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### Air pollution and human health

- Air pollution (outdoor & indoor) was associated with 8.1 million premature deaths in 2021 [1]
- Outdoor air pollution accounts for more than half of those deaths, worldwide [1,2]

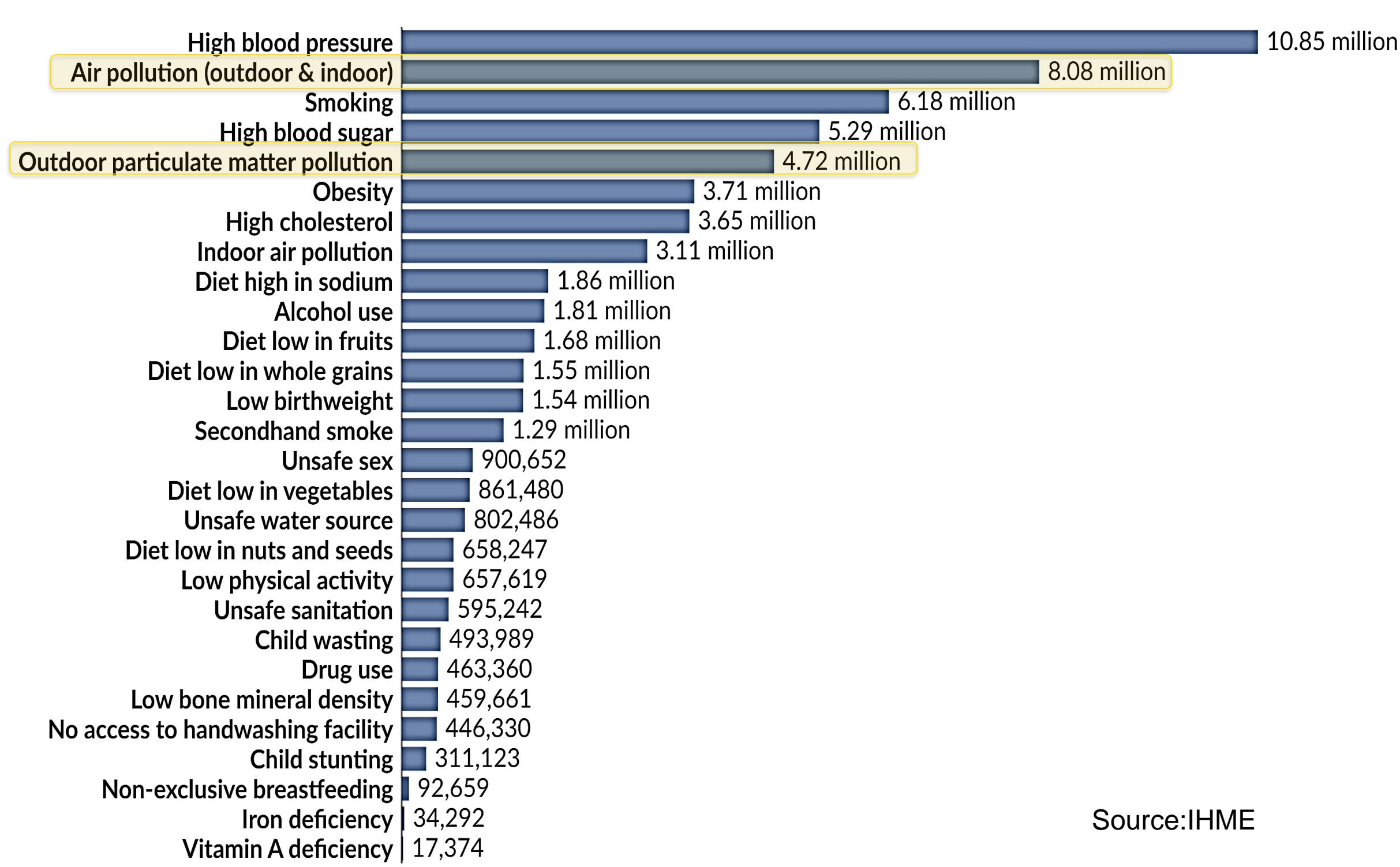
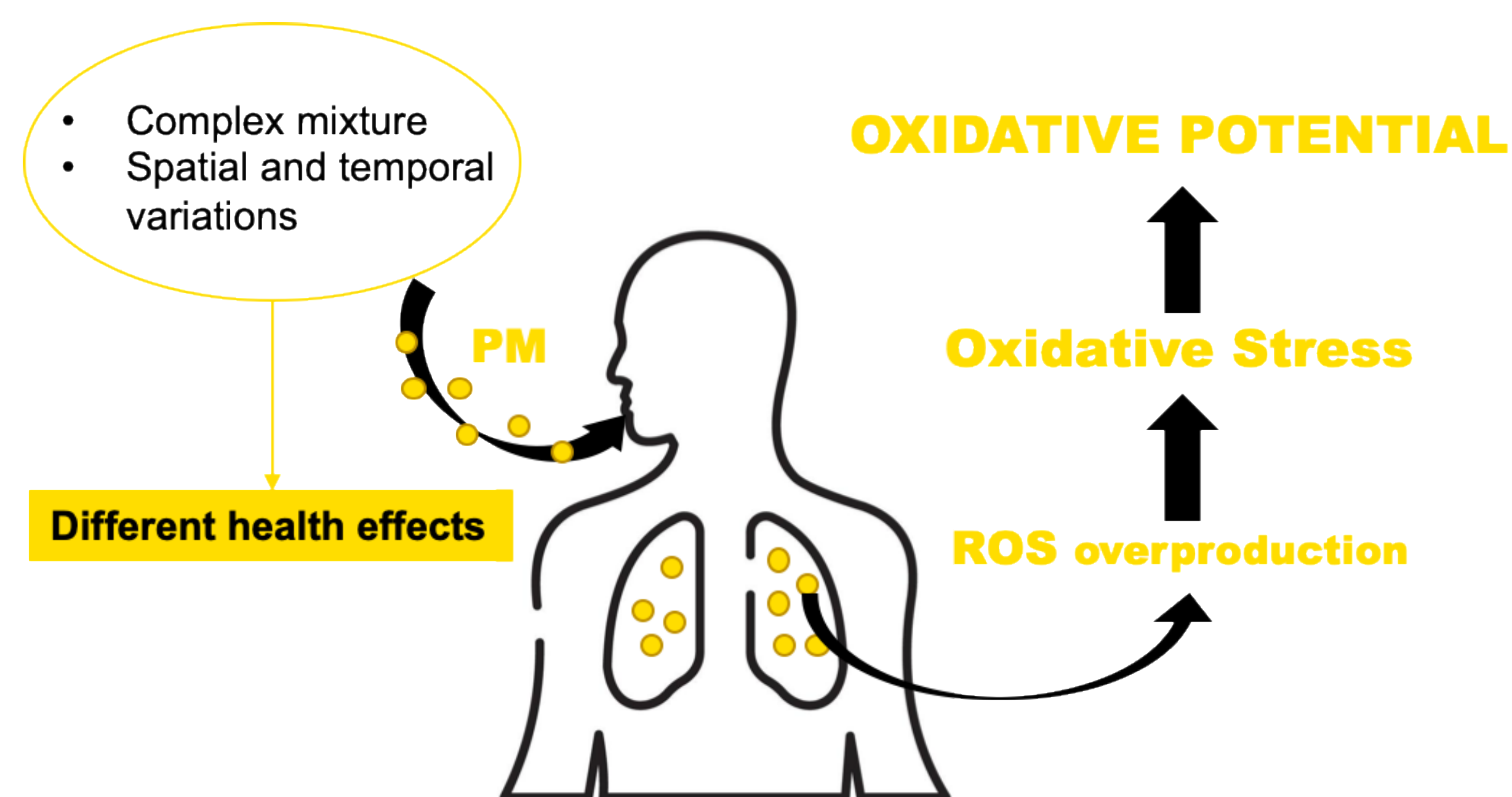


Figure 1 Global annual number of deaths by risk factor, in 2021 [1]

- PM has been assessed regarding its concentration, without considering the complexity of its components which may have differing health effects [3,4]
- PM can induce **OXIDATIVE STRESS**
  - ROS concentration exceeds the body's antioxidant capacity [4]
  - Associated with **several health outcomes** including cardiovascular diseases, obstructive pulmonary disease, kidney disease, neurodegenerative diseases and cancer [5]
- OXIDATIVE POTENTIAL (OP)** measures the capacity of PM to induce the formation of ROS in the human body [6,7]

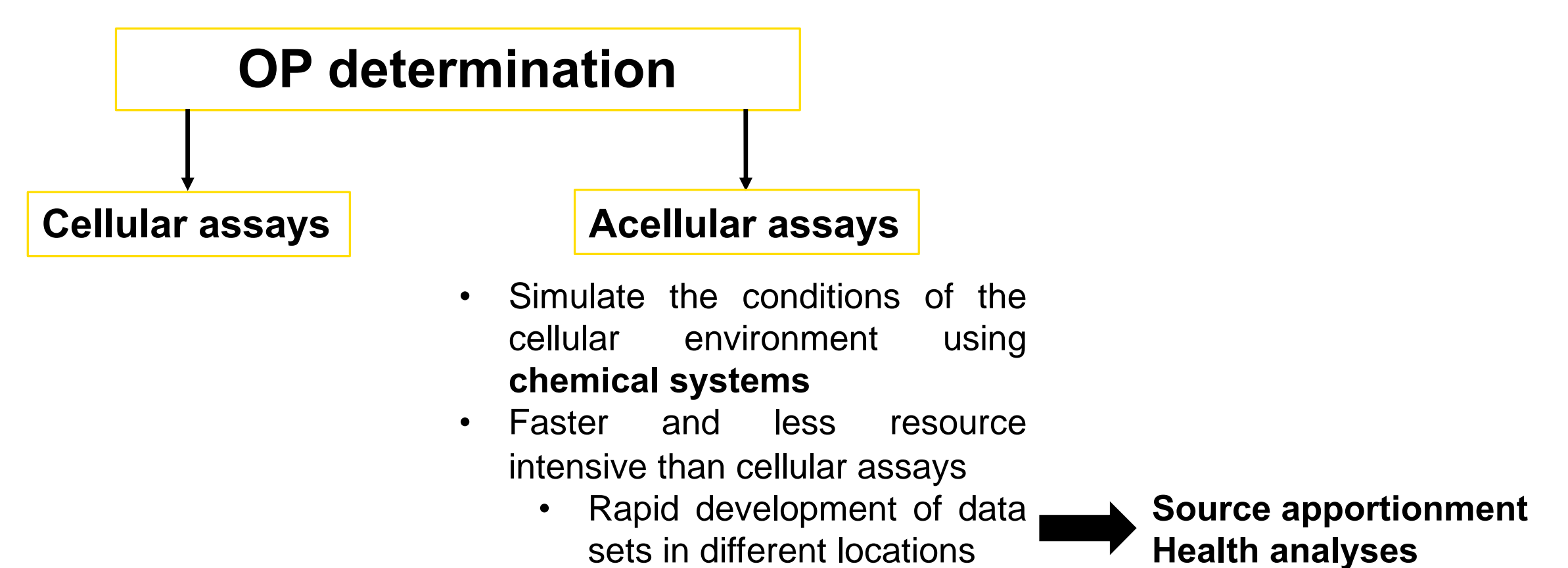


#### Acknowledgments

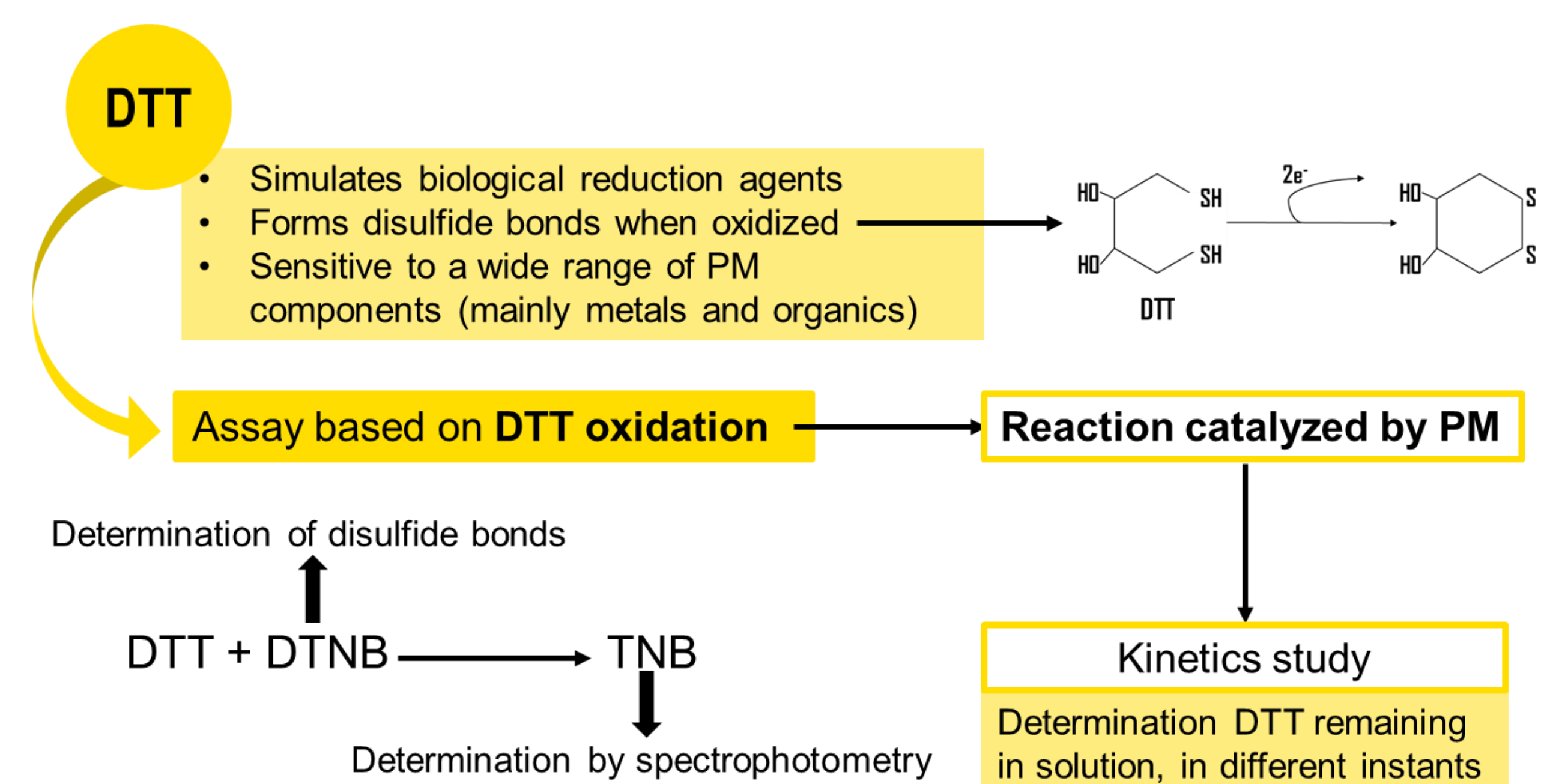
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### Oxidative Potential

- OP combined with information about the sources and composition of PM is important to create **new directives** [8]
- The **lack of a standard method** makes it difficult to compare results [7]



- DTT assay** is one of the most common methods to assess OP



### Aims of the PhD project

- Optimization** of OP methodology (via DTT assay), based on the process described by Chirizzi et al. (2017) [9]
- Chemical characterisation** of indoor and outdoor PM<sub>2.5</sub> samples
- Categorisation of PM<sub>2.5</sub> samples by their oxidation potential
- Identification of **main drivers of OP** in fine aerosols
- Categorisation of pollution sources based on their health impact and strategies to minimise it
- Validation of **estimation model** of OP in fine aerosols

#### References

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