

# **Analysis of how much Polish people know about the impact of air pollution on human health.**

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## **Introduction:**

There is an extensive body of literature indicating that air pollution can have an adverse effect on human health. Due to exposure to PM<sub>2.5</sub> fine particulate matter alone, which comes from low emission sources (home furnaces, old local solid fuel boilers, etc.), 19,000 people could die and a total of 450,000 years of human life was lost in 2016<sup>1</sup>. Over 40,000 Poles are estimated to die prematurely annually due to air pollution<sup>2</sup>.

In response to insufficient ecological knowledge of Polish people, the Ministry of Health decided to ask Read-Gene S.A. centre that carries out genetic research on malignant cancer forms to run a project on *Prevention initiatives aiming at preventing diseases involving pollution and climate change issues in terms of points 2.1.12 of Operational Objective Number 4 Limitation of health risk resulting from physical, chemical and biological risk factors present in the external environment including home, recreation and studying*. The project was named: *Time for clean air*. The aim of the project that has been carried out with the funds of National Health Program 2016-2020 financed by Health Ministry is to increase knowledge and sensitivity of Poles to issues involving degradation of broadly understood environment.

Representatives of four key professional and social groups were asked to participate in the project, including journalists, teachers, doctors and NGO activists to get through with the message.

## **Materials and methods:**

10,528 anonymous subjects aged 16 – over 65 took part in the study. Paper forms were filled in by 10,000 subjects. 528 additional people completed the form available at [www.czasnaczystepowietrze.pl](http://www.czasnaczystepowietrze.pl) 5,513 (52.37%) subjects were female and 5,015 (47.63%) were male. Subjects aged 16 – 25 constituted the largest group of 3,921 (37.24%). The smallest group was made up by subjects between 36 and 45 years of age – 954 people, i.e. 9.06%. Subjects had secondary (4,652 i.e. 44.19%), primary (3,381 i.e. 32.11%) and higher education (2,495 i.e. 23.70%). The largest group of respondents (2,367 i.e. 22.48%) came from cities with population of 100,001 to 300,000 residents and the smallest came from villages people by fewer than 1,000 residents.

The distribution of dichotomous variables in statistical analysis was characterised by number (n) (k) and frequency (%) of different categories among investigated men and women. Differences between gender, age, education and place of residence were also compared.

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<sup>1</sup> Adamkiewicz, Ł. *Zewnętrzne koszty zdrowotne emisji zanieczyszczeń powietrza z sektora bytowo-komunalnego*, raport Ministerstwa Przedsiębiorczości i Technologii, 11.09.2018.

<sup>2</sup> EEA (European Environment Agency), *Premature deaths attributable to PM<sub>2.5</sub>, NO<sub>2</sub> and O<sub>3</sub> exposure...*, <https://www.eea.europa.eu/highlights/improving-air-quality-in-european/premature-deaths-2014>, [accessed on 30.8.2019].

## Results:

- 66.52% of respondents stated that air pollution (AP) had bad effect on health.
- According to respondents AP is most frequently responsible for respiratory diseases – asthma (47.06%), chronic bronchitis (42.75%), allergy (33.85%) and lung cancer (32.21%). Respondents rarely linked AP with onset or exacerbation of Parkinson's disease (10.03%), bladder cancer (11.20%), stroke (12.49%), arrhythmia (13.38%) and coronary artery disease (13.45%).

Women were convinced more often than men that AP can cause or exacerbate asthma F(14.76%) vs. M(13.77%), chronic pneumonia F(8.30%) vs. M(7.95%), allergy F(10.52%) vs. M(10.00%), heart attack F(5.41%) vs. M(4.43%). The reverse was true for chronic bronchitis M(13.09%) vs. F(12.88%), raka pęcherza M(3.55%) vs. F(3.26%), arrhythmia M(4.46%) vs. F(3.67%) hypertension M(6.18%) vs. K(5.64%). F(2.82%) vs. M(3.48%) reported they had no knowledge.

- AP sources in Poland named by respondents: old boilers and household furnaces (49.24%), industrial plants (46.12%), road transportation (44.70%) and agriculture (38.35%). 16.26% of respondents had no knowledge on these issues.
- The most often quoted proper types of behaviour during alerts included:
  - a. limited going out to necessary minimum (44.47%),
  - b. when respiratory and cardiovascular diseases are getting more acute – contacting the doctor (37.52%),
  - c. the need for particular health protection of children and the elderly (31.82%).
- Respondents received information on AP adverse effect on health through television (48.45%), radio (39.03%), press (34.69%), the Internet (33.78%), teachers (32.98%) and doctors (20.01%).
- According to respondents, information about AP effect on health:
  - a. was usually given with language that can be understood (35.13%),
  - b. encourage to care about the environment (34.58%),
  - c. raise the interest in the problem (31.72%).

The answers ticked less frequently included: information is boring, difficult to understand owing to complex vocabulary and rarely published.

## Conclusions:

1. The knowledge of Polish people on adverse effect of air pollution on health needs to be constantly improved and broadened.
2. The educational campaign „Time for clean air” was conducted for four basic professional and social groups. Many multimedia events, educational meetings with experts, workshops, trainings and media publications were organised as part of the project. Therefore, it seems necessary and proper to continue the program.

*The questionnaire survey was conducted between 4 June and 3 December, 2018.*