

Surveys of willingness-to-pay to avoid negative chemicals-related health effects (SWACHE)



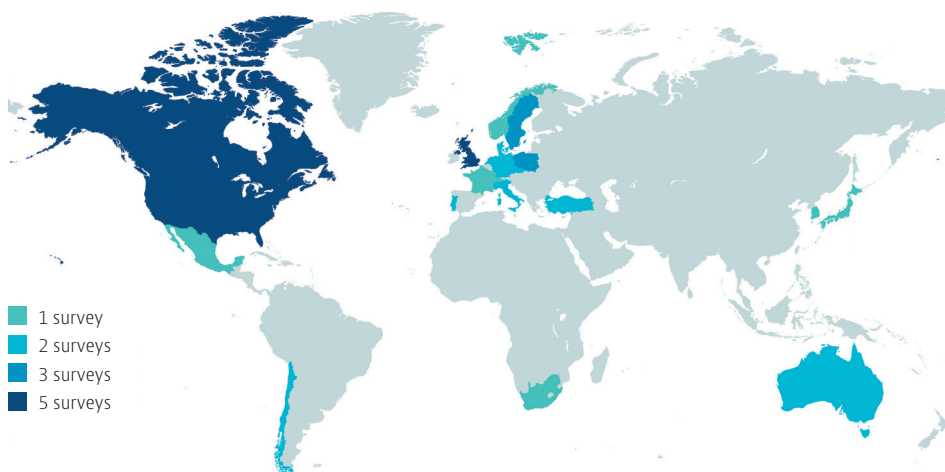
IMPROVING THE KNOWLEDGE BASE FOR THE COST OF INACTION ON CHEMICALS

Chemicals are part of our daily life and must be soundly managed to limit risks to human health and the environment. While countries around the world are setting up legal frameworks to address these risks, the cost of policy inaction is still poorly understood. Assessment of chemicals management options and environmental policies can be considerably improved by better estimating their costs and benefits. Financing national chemicals management programmes also often requires economic justification of the benefits of such an investments. However, data to support such analyses are lacking.

The OECD project **Surveys on Willingness-to-Pay to Avoid Negative Chemicals-Related Health Impacts (SWACHE)** project brings together expertise on chemical safety and economic analysis to fill this gap. The project aims to establish internationally comparable values for the willingness-to-pay (WTP) to avoid negative health effects due to exposure to chemicals. Such values can be used to demonstrate and measure the economic benefits of minimising the impacts of chemicals on human health.

To derive WTP values, surveys of a large number of citizens of countries have been conducted. These surveys apply state-of-the-art approaches that can be used by economists to determine the full monetary value that survey respondents place on reducing their risk of a particular health effect.

Figure 1:
Countries in which the first round of SWACHE surveys was implemented



5

Health effects

Kidney disease, asthma, infertility, very low birth weight, IQ loss

1-5 surveys implemented in

22

Countries

46

Surveys in total

1 200

respondents

per country, per health effect

The SWACHE project is organised in two rounds focusing on five health effects each. The health effects included in the first round are:

- asthma
- infertility
- IQ loss
- chronic kidney disease
- very low birth weight

The first round of surveys was implemented in 2022. Each survey, specific to one health effect, was implemented in at least five countries. For each group of country and health effect, a representative sample of at least 1 200 respondents was collected. Overall, one to five of the surveys were implemented in 22 countries, totalling 46 surveys conducted.

The second round of health effects will include thyroid dysfunction, miscarriage, hypertension, non-fatal cancer and skin sensitisation and will be carried out in 2023.

Survey responses are empirically analysed to estimate mean WTP for a given reduction in health risk. Values of a statistical case are derived by dividing mean WTP by the average risk reduction.

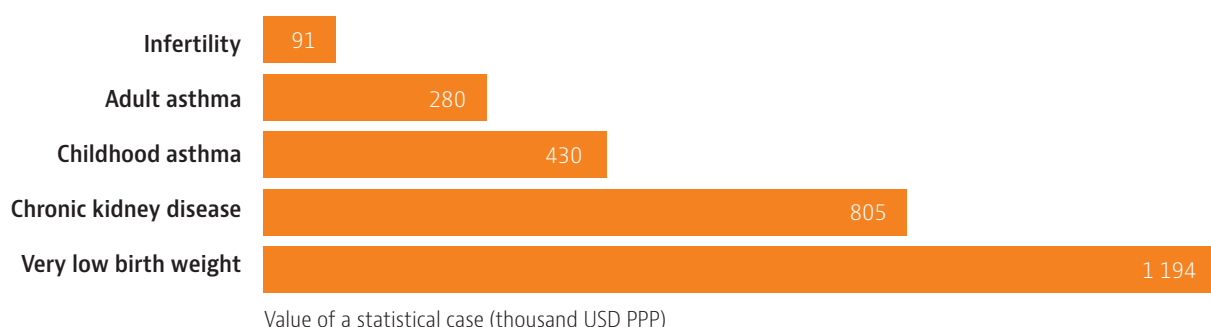


THE MONETISED BENEFITS OF REDUCING CHEMICALS RELATED NEGATIVE HEALTH EFFECTS ARE CONSIDERABLE

The first round of surveys clearly indicates that people are willing to pay a significant amount to reduce their risk of developing various negative health effects. The value of a statistical case is estimated in USD Purchasing Power Parity (PPP) from USD 91 000 for infertility to USD 1 194 000 for very low birth weight, on average, across the countries surveyed. The second highest value is found for chronic kidney disease (USD 805 000) followed by childhood asthma (USD 430 000) and adult asthma (USD 280 000).

The mean WTP for reducing asthma severity equals USD 529 per year for adults and USD 948 per year for children. People living in surveyed countries are also willing to pay USD 3 050 on average to avoid the loss of one IQ point in children.

Figure 2:
Value of a statistical case by health effect, average across countries



These values can be used in benefit-cost analysis of chemicals management options. Typically, benefits of a given policy is measured by multiplying value of a statistical case by the number of statistical cases prevented every year by the policy. Annual benefits are then summed across health effects and years. The net present value of a policy option is equal to the difference between the total discounted benefit and the total discounted cost. Overall, the WTP values estimated by the SWACHE project provide significant evidence that chemicals management systems are worth implementing.



MONETISED BENEFITS BY HEALTH RISK AND BY COUNTRY

The health effects examined in the first round of the SWACHE project have all been associated with exposure to certain chemicals. The survey results can inform cost benefit analysis regardless of the specific chemical or the nature and pathway of the chemical exposure.



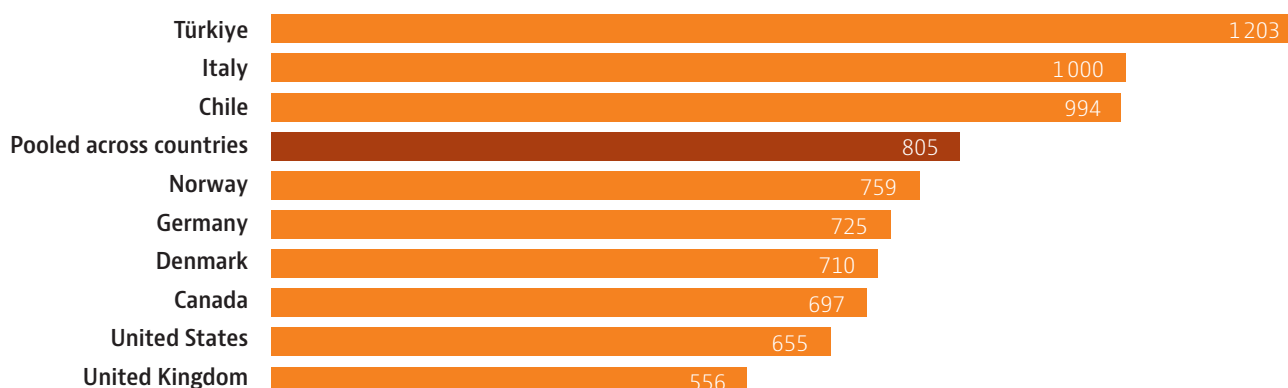
Chronic kidney disease

Chronic kidney disease has important negative impacts on the quality of life and can lead to severe health complications such as cardiovascular diseases, bone fragility, weakened immune systems, etc.

Valuation studies to date have focused on the final stage of chronic kidney disease that is permanent kidney failure that requires dialysis or kidney transplant. In the SWACHE chronic kidney disease survey, a range of severity (stage 3 and 4) that captures symptomatic kidney disease, including specific impacts from disease progression was valued. This novel approach provides a more useful estimate for benefit-cost analysis and makes the results more representative of the full impact of chemical exposure causing kidney disease on peoples' lives.

Figure 3:

Value of a statistical case of chronic kidney disease



Value of a statistical case (thousand USD PPP)

The SWACHE chronic kidney disease survey was fielded in nine countries. In each country, a sample of at least 1 200 respondents representative of the general population was collected and empirically analysed. The value of a statistical case of chronic kidney disease varies from USD 556 000 in the United Kingdom to USD 1 203 000 in Türkiye.

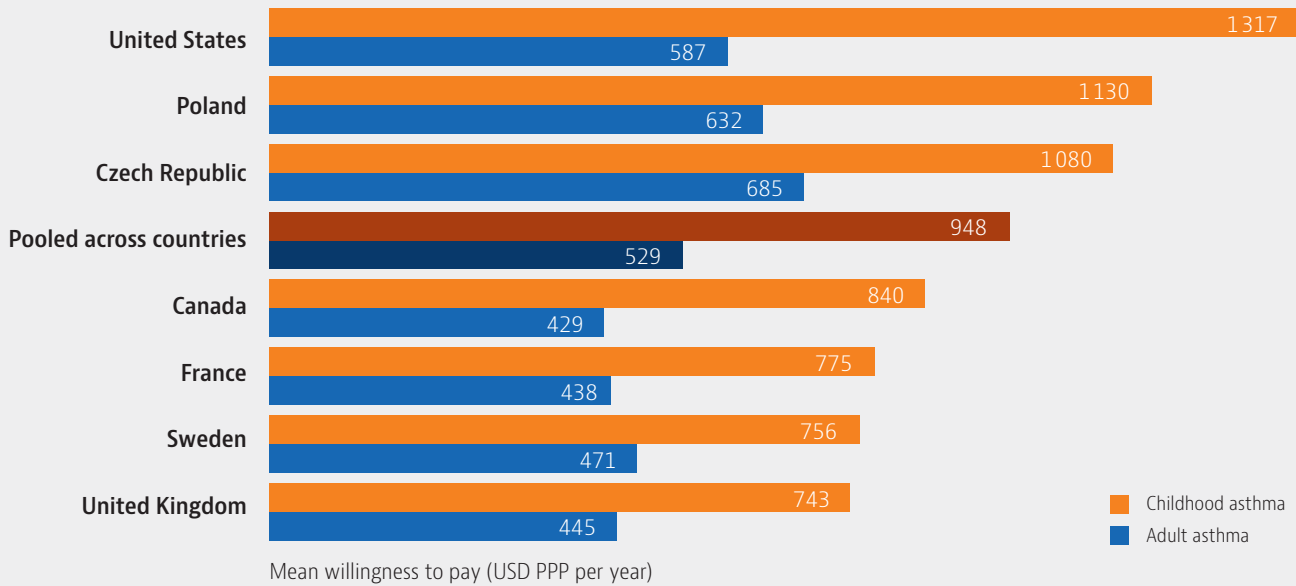


Asthma severity and risk in adults and children

Asthma is a non-curable long-term condition affecting children and adults. Asthmatics experience symptoms such as coughing, wheezing, shortness of breath and chest tightness. Depending on its severity, asthma can prevent normal outdoor activities, require routine medication and sometimes oxygen intake. Severe asthma can require emergency room visits and hospitalisation.

Previous valuation work does not provide internationally comparable WTP values for asthma risk and severity. To fill this gap, the SWACHE asthma survey asks what asthmatics are willing to pay to reduce their asthma severity e.g. from severe to moderate plus. Further, it asks people who do not have asthma what they are willing to pay to reduce their risk of getting it. Finally, the survey asks parents what they are willing to pay to reduce: i) the severity of the asthma of their youngest asthmatic child, and ii) the risk that their youngest non-asthmatic child get it.

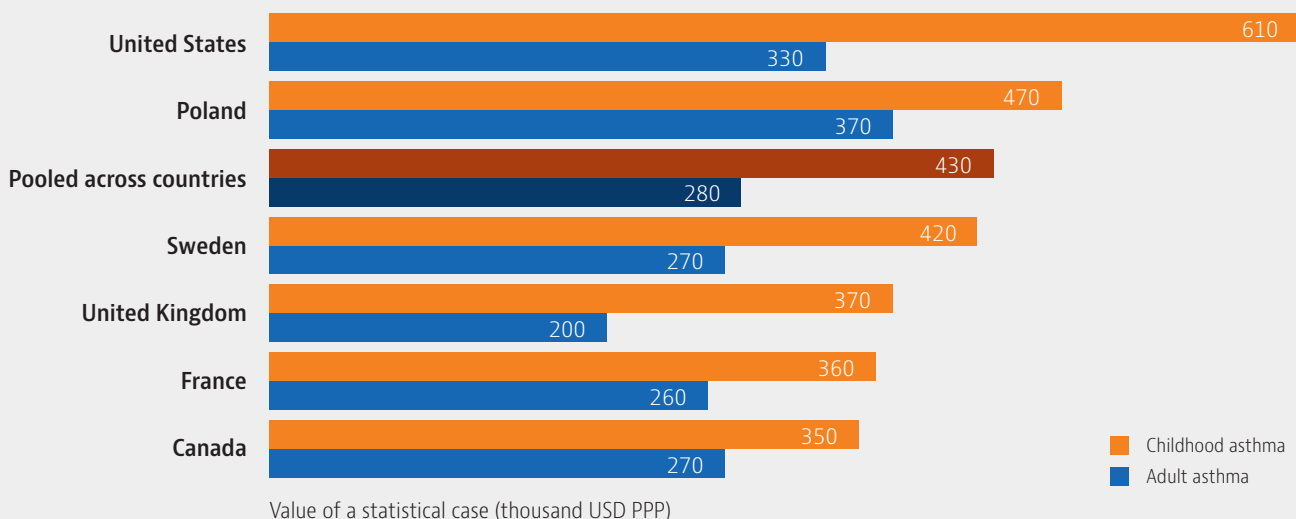
Figure 4:
Mean WTP value
for reduced asthma
severity



The survey was implemented in seven countries. In each of these countries, a sample of at least 1 600 respondents (1 200 non-asthmatic adults, 300 asthmatic adults and 190 parents of asthmatic children) representative of the general population was collected and analysed.

The mean WTP for reducing *adult* asthma severity varies from USD 429 per year in Canada to USD 685 per year in Czech Republic. The mean WTP for reducing asthma severity in *children* is higher and varies from USD 743 per year in the United Kingdom to USD 1317 per year in the United States. The value of a statistical case of *adult* asthma varies from USD 200 000 in the United Kingdom to USD 370 000 in Poland. The value of a statistical case of *child* asthma varies from USD 350 000 in Canada to USD 610 000 in the United States.

Figure 5:
Value of a statistical
case of asthma





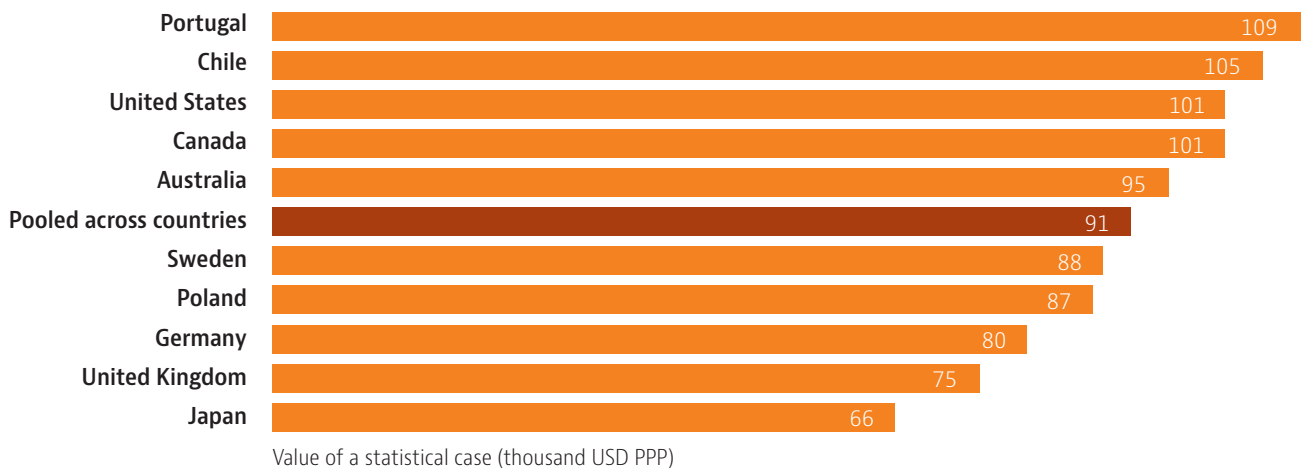
Infertility risk

Infertility is the inability of a couple to get pregnant after an extended period of trying. Declining fertility rates are a concern for many people in OECD countries.

Previous studies estimated the WTP for improved fertility, but many focused on assisted reproduction technologies. These previous studies estimated a value per statistical pregnancy. Overall, the existing metrics are difficult to apply in regulatory impact analysis. The SWACHE infertility survey was designed to elicit WTP for a reduced risk of infertility that can be easily used in benefit-cost analysis.

The survey was fielded in ten countries. In each country, a sample of 1 200 adult respondents planning and in capacity to have a child within the next five years was collected and analysed. The value of a statistical case of infertility varies from USD 66 000 in Japan to USD 109 000 in Portugal.

Figure 6:
Value of a statistical case of infertility



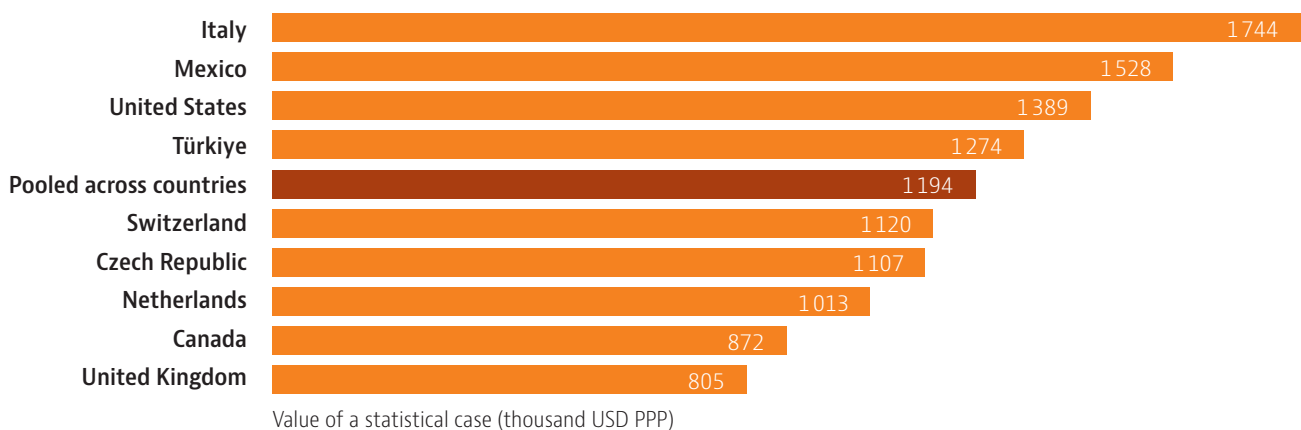
Very low birth weight

Very low birth weight can lead to serious health complications such as neurosensory problems, behavioural and social competency issues as well as learning disabilities.

Internationally comparable estimates of the economic benefits of reducing exposure to chemicals and consequent health risks associated with very low birth weight are rare. The SWACHE very low birth weight survey fills this gap by asking adults planning to have a child how much they are willing to pay over a period of eight months to reduce the risk of very low birth weight.

The survey was implemented in nine countries. In each country, a sample of 1 200 adult respondents planning and in capacity to have a child within the next five years was collected and analysed. The value of a statistical case of very low birth weight varies from USD 805 000 in the United Kingdom to USD 1 744 000 in Italy.

Figure 7:
Value of a statistical case of very low birth weight





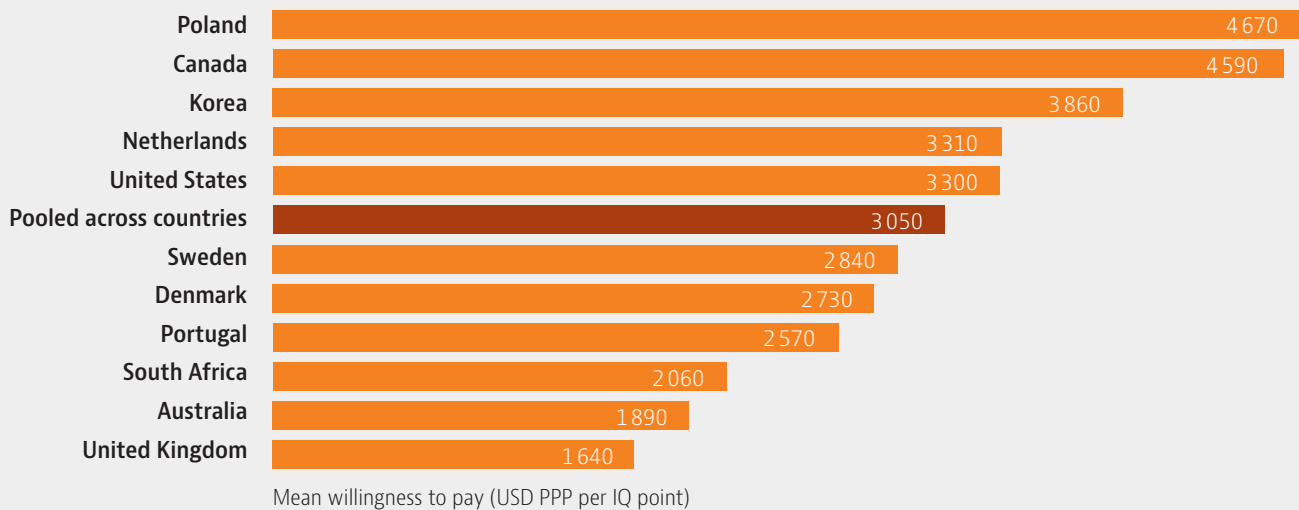
IQ loss in children

IQ loss is associated with lower education achievement, lower lifetime income and higher probability to engage in criminal behaviour. Yet, there is no internationally comparable value of the WTP to avoid the loss of one point of IQ that can be used in socioeconomic analysis of chemicals management options. The SWACHE IQ loss survey asks adults to value a certain reduction in IQ loss for their own hypothetical child.

The SWACHE IQ loss survey was implemented in eleven countries. In each country, a sample of at least 1200 respondents representative of the general population was collected and empirically analysed. The main WTP to avoid one IQ point loss in children varies from USD 1 640 in the United Kingdom to USD 4 670 in Poland.

Figure 8:

WTP value for avoiding the loss of one IQ point in children



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