

ADDRESSING HISTORICAL POLLUTION IN THE FLEMISH REGION OF BELGIUM: THE ISSUE OF CADMIUM (UPDATE AUGUST 2008)

Lung cancer study

In January 2006, the medical journal *The Lancet Journal of Oncology* published a study ("Environmental exposure to cadmium and risk of cancer: a prospective population-based study", Nawrot et al.) of an epidemiological survey associating the development of lung cancer to environmental exposure to cadmium among the people living close to Umicore's former zinc operations in the north of Belgium (Balen and Overpelt).

The study focused on a sample of people (521) who lived close to those sites in the period 1985-1989. The sample was subsequently followed up to investigate the link between lung cancer and environmental exposure to cadmium, although the researchers admitted that *"the number of people who developed cancer was fairly small"* and that *"observational studies ... do not prove causality"*.

A recent study on the incidence of cancer in the Belgian province of Limburg ("Ten years of cancer in the Belgian province of Limburg 1996-2005"; D. Lousbergh et al, Hasselt/Leuven) published by the Limburg Cancer Registry in November 2007 (<http://likas.edm.uhasselt.be/scripts/php/showdoc.php?id=147>), did not find any geographical cluster of lung cancer (which has an incubation period of 10 to 30 years), more than 30 years after the plants in Balen and Overpelt switched to a more environmentally friendly production method: *"In the spatial analysis of cancer incidences 1996-2005, we didn't find any cluster of lung cancer in males, however in females an increased relative risk of 1.2-1.5 was detected in St. Truiden. As this is only one municipality, we draw no conclusions from this finding"*.

Two recent similar Dutch studies related to zinc sites in Eijsden (http://www.limburg.nl/nl/html/algemeen/Actueel/Persberichten/Persberichten.asp?nieuws_item=V6PJA374RPF523635K51) and Budel (www.ikcnet.nl/bibliotheek/index.php?id=2132) also found no link between exposure to cadmium and increased health risks and/or the occurrence of (lung) cancer.

History of zinc production

Umicore was involved in the production of zinc in that region for more than 100 years (Umicore's zinc refining and alloys business was transferred to a new company, Nyrstar, in September 2007): the company switched to a much more environmental-friendly production process in the early 1970s, abandoning the pyro-metallurgical process. Umicore has always respected the emission standards set by the government. It is nonetheless clear that standards which were considered appropriate 100 years ago, no longer are, given today's scientific knowledge.

Production of cadmium ceased altogether in 2002, after the production of cadmium-containing materials was gradually phased out in the 1990s. Recent measurements point to almost undetectable concentrations of cadmium in the ambient air around our former production sites.

Action plan

Following The Lancet publication, the Flemish government published a 39 point action plan, which Umicore fully supported. The measures in relation to the remediation of the historic pollution are consistent with the covenant signed with the Flemish Government and the Flemish Waste Authority (OVAM) in April 2004. At that time Umicore agreed to spend a combined € 77 million on the remediation of the soil and groundwater in and around its plants in Hoboken (near Antwerp), Balen and Overpelt over a period of 15 years. The creation of Nyrstar in September

2007 did not alter the covenant. Whereas Nyrstar bears responsibility for the remediation of the plants and their immediate surroundings, Umicore continues to bear responsibility for the wider surroundings (up to 9 km from the plants).

The action plan called for an acceleration of certain remedial actions in the neighborhood of the plants in Balen and Overpelt. Umicore agreed to accelerate the removal of the zinc ashes. In the past, in accordance with a practice common at the time, private citizens often used these ashes obtained from the thermal processing of zinc ores, to pave their drive-ways. However, these ashes contained residual zinc and cadmium, now known to present a potential health hazard. The excavation works started almost simultaneously and were completed by the summer of 2007, removing an important source of potential contamination. Umicore, along with OVAM, has recently extended this initiative to the wider region, offering private citizens the option to have zinc ashes which may present a health hazard, removed free of charge.

Umicore also committed to evaluate the feasibility of a cancer study amongst its workers who were previously exposed to cadmium at the workplace. By doing this Umicore wanted to make sure that the control and prevention measures taken in the past had been effective in protecting its work force. This study, part of the action plan issued by the Flemish regional government, was finalized in September 2007. The study made clear that sufficient information was available to conduct a comprehensive cancer study at the sites in Balen and Overpelt. Umicore has communicated the outcome of the feasibility study to the Flemish authorities.

Biomonitoring results

Umicore also supported the Ministers' initiative to repeat the biological monitoring of the local population and its comparison to data that were used in The Lancet study. The results of the biomonitoring study (<http://www.mmk.be/vrij.cfm?id=335#rapporten>) were published in June 2008: *"The body burden (of cadmium) has clearly dropped in the course of time, on average below the current norms below which no health risks can be expected to occur ... We expect the average body burden to continue to drop, also in the future"*. Compared to the period 1985-89 (covered by the Lancet study), the presence of cadmium in urine has dropped by 55 percent. But the study also said that *"especially those people who were already living in the region when the pollution was larger, still have a higher body burden and present a higher health risk"*.

Professor Jan. A. Staessen et al in August 2008 published a mortality study (a follow-up to his 2006 lung cancer study), the conclusions of which (<http://www.ehponline.org/docs/2008/11667/abstract.html>) were in line with the abovementioned biomonitoring. Umicore considers the study to be an extra encouragement to complete its ongoing remediation projects and to continue the implementation of the measures foreseen in the Cadmium action plan of the Flemish Government.

Prevention

The biomonitoring study added that food marks the main source of exposure to cadmium (growing of vegetables in the backyard etc.). The local Belgian authorities, for many years now, have been offering the local population (notably via a recently revamped information booklet) useful tips on how to limit, to the greatest extent possible, contact with cadmium, both indoors and outdoors. The biomonitoring study stressed that these measures *"are effective and are best maintained and promoted to keep the body burden at a low level and diminish it further"*.