NINTH COLLEGIUM RAMAZZINI STATEMENT

# PREVENTING CHEMICAL ACCIDENTS: LESSONS LEARNED SINCE THE BHOPAL DISASTER IN 1984

# PREVENIRE GLI INCIDENTI NELL'INDUSTRIA CHIMICA: LE LEZIONI APPRESE DAL DISASTRO DI BHOPAL DEL 1984

On the 20th Anniversary of the Bhopal disaster in India, the Fellows of the Collegium Ramazzini express our condolences to and compassion for the more than 500,000 people who were harmed by the toxic gas tragedy in 1984. We praise the continued work of many community members and their supporters who have sought to alleviate the consequences from this disaster. Lessons learned from the Bhopal incident and others must be used to prevent similar events.

At least 2,500 children, women and men were killed suddenly by the release of toxic gases from a runaway chemical reaction at a production facility in the Indian state of Madhya Pradesh on the early morning of December 3, 1984. People exposed to methyl isocyanate and other toxic gases suffered injuries to their eyes and respiratory tract, and some also suffered neurological effects. The gas release damaged animals, plants and the ecosystem. The long-term consequences of the exposure are still unfolding: thousands of residents suffer chronic diseases with multiple symptoms and impairments that undermine the health and productivity of the community. Governmental and private organizations have provided clinical facilities for the care of the victims, though not enough to satisfy the medical and social needs. The site has not been remediated, and remains a source of toxic chemicals that continue to contaminate air, water and soil and endanger public health.

The Bhopal tragedy is the world's worst, reported chemical disaster, but it is not unique. Other major incidents have occurred, e.g., the dioxin release in Seveso, Italy in 1976, the ammonium nitrate explosion in Toulouse, France in 2001 and the hydrogen sulphide poisoning in Chongqing, China in 2003. Major disasters have prompted considerable advances in science, technology, administration and regulation at national, regional and international levels. Notably, these include the ILO Convention concerning the Prevention of Major Industrial Accidents (No.174), and a multi-stakeholder framework for an integrated approach in worldwide management of chemical risk. Further global progress in this direction is now more urgently needed in the light of increasing market pressures and the prospect of terrorism.

The manufacture, transportation, usage and disposal of hazardous chemicals have increased rapidly over the last few decades in both developing and developed countries. Of 11 million known chemicals, about 100,000 are currently produced on an industrial scale with more than 1,000 new chemicals entering the market each year. For more than 85% of the 2,500 chemicals generated in quantities greater than 1,000 tons per producer per year, little or nothing is known concerning human and environmental health effects.

Major chemical runaway reactions, explosions, fires, leaks and spills have followed increasing industrialization worldwide, with particularly severe incidents occurring in newly industrialized countries. The public and private infrastructure for oversight, control, planning, mitigation and response are generally insufficient. Documented consequences include fatalities, injuries, emergency evacuation, environmental contamination, and also long-term health *sequelae* among children, including those of exposed parents.

Early warning signs and lessons from major disasters are too often ignored. Consequently, incidents continue to occur. Because effective surveillance and independent investigations are largely absent, incident trends, patterns of occurrence and underlying causes are neither identified nor corrected. Inadequate economic incentives, weak public and private policies, and insufficient resources for effective governmental intervention impede the development and deployment of appropriate prevention strategies.

The Collegium Ramazzini reviewed these issues at an international conference held in Carpi, Italy, on October 28-29, 2004. Physicians, engineers, and public health officials representing academia, national governments, industries, non-governmental organizations, the European Environment Agency, the International Labour Office, and the World Health Organization participated in the discussions.

On the basis of these deliberations, the Collegium Ramazzini calls for:

for the Bhopal community:

- better clinical management of the long-term consequences; fair settlement of remaining legal claims regarding causes, consequences and remediation; expanded scientific studies to assess harm and implement recovery from the 1984 disaster;

for the Global Community (governments, chemical enterprises, workers, scientific and medical professionals):

- improved effectiveness of public and private policies, compliance auditing and enforcement, and allocation of resources sufficient to prevent unintended chemical releases and their consequences;
- expanded programmes of mandatory toxicity testing that examine long-term effects of commercial chemicals on human health and the environment and that systematically examine all toxicological impacts, including the neglected areas of reproduction and development;
- expanded national and international incident surveillance programmes, and increased independent, multidisciplinary investigations of incident root causes and consequences;
- primary prevention approaches based upon inherently safer chemical production, use, distribution, handling and disposal to reduce risks from catastrophic incidents whether attributable to mismanagement or intent;
- strengthened management systems based on the ILO guidelines on occupational safety and health management systems (ILO-OSH 2001);

– enhanced worker and community rights to know about and to participate in decisions regarding chemical hazards, risks, and measures to prevent, respond to and recover from incidents at facilities engaged in production, use, distribution, handling and disposal of hazardous chemical products;
– land use planning to ensure separation from residential and public areas of commercial facilities that produce, use, distribute, handle and dispose hazardous chemicals, and facility planning to ensure on-site separation of incompatible chemical hazards and other precautionary measures to reduce risks to workers and the community;
– capacity building among all stakeholders for emergency prevention, preparedness and response to ensure global harmonization of safer production, use, distribution, handling and disposal of hazardous chemicals;
– education of health care providers to ensure that occupational/environmental health and toxicology are incorporated into basic and continuing medical education.