

Public health impacts of the International Network of Paediatric Surveillance Units

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on behalf of all national paediatric surveillance unit investigators

For many uncommon but important paediatric conditions and disorders, there is a lack of national data on disease incidence, disease burden, short-term outcomes, or the impact of preventive health measures on incidence and outcomes. Sometimes, even the availability of national data is not sufficient to advance knowledge.

The International Network of Paediatric Surveillance Units (INoPSU) <www.inopsu.com>, comprising 13 national member countries, was established to address these important information gaps. Many studies have been undertaken simultaneously, allowing for comparison among different geographical regions. Study results have affected public health and clinical care, and provided new and timely data to advise on the development of new policies and legislation.

LEARNING POINTS

Since its inception in 1998, INoPSU, a network that involves more than 10,000 clinicians seeing more than 50 million children, conducted studies that have provided scientific evidence to support the following public health actions (Table 1).

Vaccine-preventable diseases

- **Pertussis infection:** International study results have demonstrated the severity of this infection and the possibility of transmission from older family members to children too young to be vaccinated. In several countries, this led to a review of the age for administering the first vaccine, and to a targeted approach for adult and adolescent immunization programs. Furthermore, surveillance in Cyprus quickly identified an outbreak, providing valuable information to public health authorities.
- **Neonatal herpes simplex virus (HSV):** Study results demonstrated significant mortality rates in some countries, with HSV-1 as the most prevalent type. The need for an effective HSV-1 and HSV-2 vaccine is evident.
- **Congenital cytomegalovirus infection (CMV):** All countries documented the severity of this illness, which is the most common infectious cause of birth anomalies.

Following a two-year study in Canada, only severely affected CMV cases were being detected, representing a fraction of the expected numbers. Study results support the need for a new vaccine as well as routine CMV screening.

Clinical practice guidelines and health planning services

- **Hemolytic-uremic syndrome:** This syndrome peaks in most countries during the summer, with outbreaks due to different strains of Shiga toxin-producing *Escherichia coli* acquired from water, hamburger meat and petting farms. Surveillance of hemolytic-uremic syndrome in seven different countries described the geographical differences of prevalent strains of *E. coli*. Study results supported legislative measures for safe food production, public water testing and ongoing education on hygiene.
- **Vitamin K deficiency bleeding:** Study results demonstrated that most cases are of late onset and related to liver disease, with many patients receiving no or incomplete vitamin K prophylaxis at birth. Results reaffirmed the recommendations for the continued use of vitamin K prophylaxis to prevent hemorrhagic disease of the newborn. Administration by intramuscular injection has been shown to be the most effective.
- **Vitamin D deficiency rickets:** Although this disease is not as rare as first anticipated, the majority of cases were found in darker-skinned and exclusively breastfed children. Study results reinforce clinical practice guidelines that vitamin D supplementation should be given to all exclusively breastfed children to prevent nutritional rickets. In Australia, vitamin D deficiency rickets was most common among refugee families, supporting active screening and treatment in this vulnerable group.
- **Early-onset eating disorders:** Food avoidance was the most common clinical feature in early-onset eating disorders. Children often presented with significant weight loss, and many had medical problems (such as bradycardia, hypothermia and hypotension) and were hospitalized. In Australia, approximately 25% of

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TABLE 1
Studies resulting in public health actions

Study	National paediatric surveillance units								
	APSU	BPSU	CPSP	ESPED	GCPSU	NSCK	NZPSU	SPSU	WPSU
Pertussis infection	x			x	x	x	x	x	
Neonatal herpes simplex virus	x	x	x	x			x	x	
Congenital cytomegalovirus infection	x	x	x						
Hemolytic-uremic syndrome	x	x	x	x		x	x	x	
Vitamin K deficiency bleeding	x	x	x	x		x	x	x	
Vitamin D deficiency rickets	x		x						x
Early-onset eating disorders	x	x	x			x			
Seatbelt syndrome	x		x						
Chemistry set poisoning		x							
Accidental lamp oil poisoning				x					

APSU Australian Paediatric Surveillance Unit; BPSU British Paediatric Surveillance Unit; CPSP Canadian Paediatric Surveillance Program; ESPED German Paediatric Surveillance Unit; GCPSU Greece/Cyprus Paediatric Surveillance Unit; NSCK Netherlands Paediatric Surveillance Unit; NZPSU New Zealand Paediatric Surveillance Unit; SPSU Swiss Paediatric Surveillance Unit; WPSU Welsh Paediatric Surveillance Unit. Information on studies that are taking place in more than one country is available at <www.cps.ca/english/surveillance/CPSP/ProIntl/InternationalDevelopments08.pdf>

reported cases were boys, and in Canada, 14%. Study results demonstrate the need to establish preadolescent diagnostic criteria and early detection through the use of growth charts.

Injury prevention

- **Seatbelt syndrome:** Studies in both Canada and Australia confirmed the lack of uniform legislation and signalled high morbidity rates. In Canada, 25% of reported children were left paraplegic following a motor vehicle crash. In Australia, children injured while travelling restrained by adult seatbelts sustained serious abdominal and spinal injuries. Data gained from these studies have supported advocacy for age- and size-appropriate use of restraints in motor vehicles, and informed changes to legislation on child restraints.
- **Chemistry set poisoning:** Results of surveillance supported changes to the European Union

recommendations on safe toy packaging, including warnings and instructions on the package.

- **Accidental lamp oil poisoning:** Ingestion of even a very small amount of lamp oil can seriously harm a child. Since 1999, there has been a ban on coloured and perfumed lamp oils in Germany and other countries of the European Union. Results from 2000 to 2009 led to additional restrictions in 2009 and extended to all uncoloured and unscented lamp oils and grill lighter fluids. The quality standard of the unsafe ornamental lamps has also been improved, but they will need to meet a child-safe standard in the future.

MEMBER COUNTRIES OF THE INTERNATIONAL NETWORK OF PAEDIATRIC SURVEILLANCE UNITS: Australia, Britain, Canada, Germany, Greece and Cyprus, Ireland, Latvia, Malaysia, Netherlands, New Zealand, Portugal, Switzerland and Wales.

The Canadian Paediatric Surveillance Program (CPSP) is a joint project of the Canadian Paediatric Society and the Public Health Agency of Canada, which undertakes the surveillance of rare diseases and conditions in children and youth. For more information, visit our Web site at <www.cps.ca/cpsp>.