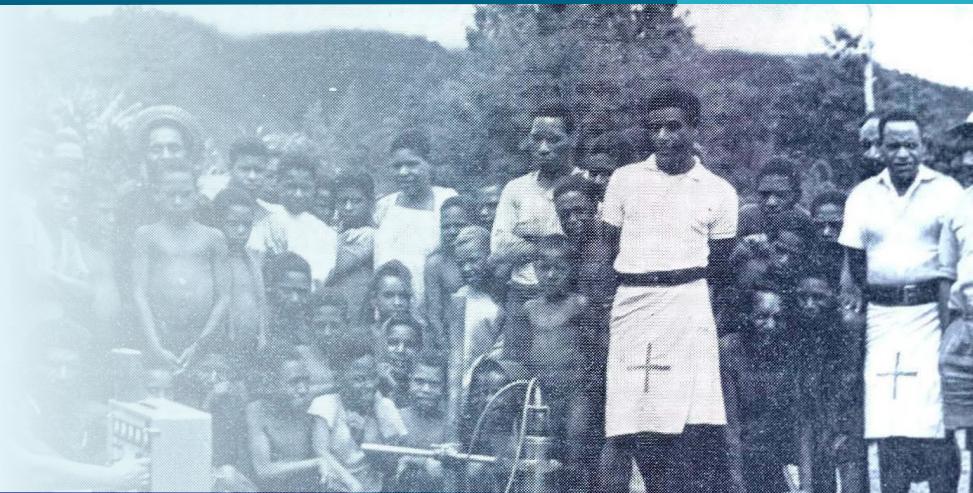




Iodine supplementation

Iodine is an essential nutrient required for normal brain development and growth. NHMRC-funded researchers established that iodine deficiency during pregnancy causes irreversible brain damage in children and demonstrated that this damage can be prevented through supplementation. This work underpinned global public health measures, contributing to the large scale reduction of iodine deficiency disorders (IDDs) in many countries and protecting millions of children from preventable intellectual disability.



Origin

Since the 1800s it had been known that iodine deficiency is associated with thyroid problems such as goitre and impaired growth and neurological development.

However, even by the 1950s the critical role of iodine in fetal and early childhood brain development was insufficiently understood. This evidence gap limited support for large-scale public health interventions, including national and international salt iodisation programs.



Investment

NHMRC supported a program of endocrine and thyroid research led by Basil Hetzel and colleagues at the University of Adelaide and associated institutions. This included researchers such as John Charnock, Brian Good, Marilyn Wellby, Michael Hoffmann, Ian Buttfeld and Evelyn Mason. NHMRC also supported the research of Creswell Eastman at Westmead.

Additional support was provided by organisations including CSIRO, and international health and aid agencies such as the World Health Organisation (WHO) and UNICEF.



Research

The team's laboratory studies confirmed the existence of profound iodine deficiency among highlanders in Papua New Guinea (PNG) and that preventing iodine deficiency in expectant mothers averted children with developmental disorders.

Their research also established that iodine deficiency causes a spectrum of adverse outcomes including miscarriage, stillbirth, foetal growth restriction and impaired neurological development. It showed that the timing and severity of iodine deficiency during pregnancy are critical determinants of outcomes.



Translation

Hetzel developed the concept of IDD, which raised awareness of the problem and mobilised governments and international agencies to take action. In 1990, WHO recognized iodine deficiency as the world's greatest single cause of preventable intellectual disability, and established the goal of eliminating it as a public health problem.

Hetzel helped build an international organisation to promote the introduction of iodine supplementation and universal salt iodisation (USI) programs.



Impact

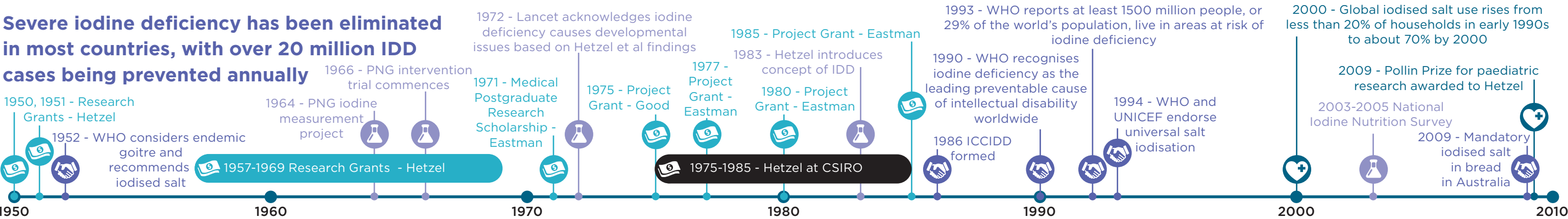
The resulting expansion of USI is regarded as one of the most successful public health interventions of the twentieth century.

The number of countries with adequate iodine intake increased from 67 in 2003 to 118 in 2020.

Between 1993 and 2019, the prevalence of clinical IDDs declined from 13.1% to 3.2%.

Approximately 20.5 million cases of IDD in newborns are now being prevented each year.

Severe iodine deficiency has been eliminated in most countries, with over 20 million IDD cases being prevented annually



Researchers

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Dr John S Charnock
Prof Creswell Eastman AO

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