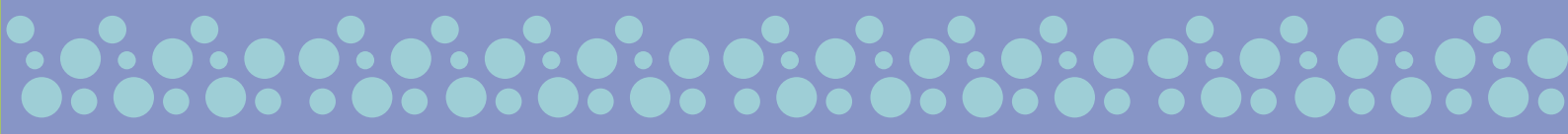




**A map of health research undertaken
on children in Ireland:
January 2000 to mid-November 2008**

**Findings from a systematic examination
of peer-reviewed journal publications**





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AUGUST 2010

OFFICE OF THE MINISTER FOR CHILDREN AND YOUTH AFFAIRS



About the authors:

Study design was by **Dr. Anne McCarthy** of the Child Health Epidemiology Division, Health Research Board (HRB), Dublin, who also drafted the report. **Sinead Foran**, also of the HRB, expanded the study research strategy, carried out the main part of the data collection, and the coding and development of the data collection manual. The database and associated information arising from this work can be accessed in full at www.childrensdatabase.ie/Irish-child-health-database/

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Executive Summary

This report presents a summary of the published journal peer-reviewed health-related literature on children in the island of Ireland for the period January 2000 to mid-November 2008. The database and associated information arising from this work can be accessed in full at the website www.childrensdatabase.ie/Irish-child-health-database/.

A total of 5,516 papers were identified from the bibliographic databases of MEDLINE, PsycINFO, SocINDEX, CINAHL, EMBASE and ScienceDirect, in response to the search criteria using the keywords 'Neonate', 'Infant', 'Child' or 'Children', and 'Ireland' or 'Irish'. The study inclusion/exclusion criteria identified 3,229 papers eligible for inclusion in the study. Papers were indexed according to: paper type (study article or other commentary); study nature (i.e. the nature of the study – analytical or descriptive); study type; topic area, classified to International Classification of Diseases (ICD-10), International Classification of Diseases for Oncology, 3rd edition (ICD-O-3) or themed and grouped under 23 health categories where these outcomes were not classifiable by ICD-10 or ICD-O-3; and specific demographic characteristics, including person type, population type and population geographical region.

There were 2,156 papers reporting study findings on over 1,200 individual health-related outcomes. The remaining articles represented varying classes of discussion paper. Studies were indexed according to recognised international definitions as one of the following: randomised controlled trial; studies on the sensitivity and specificity of a measurement tool; audit; case control study; case report; case series study; case study; cohort study; comparison study; cross-sectional study; economic study; epidemiology studies on incidence, prevalence and/or trends; intervention study; legal notes; longitudinal study; other study type, mainly related to the effectiveness of measurement tools; qualitative studies, including those of an anthropological and ethnographic nature; screening study; studies on the practice/knowledge of professionals or parents; surveillance study; and validation study.

Studies reported findings on four broad population types:

- hospital population (mother and child);
- hospital population (children and adults);
- school population;
- 'population other', a heterogeneous category consisting of:
 - children other than children attending hospital or special clinic – children with an intellectual disability, athletic, healthy purposeful sampled children, offspring of opium users, victims of sexual abuse;
 - families of children with a genetic condition or disability – consisting of triads (mother, father, child groups) and the index or proband case (i.e. the child with the outcome of interest). The most common conditions reported were attention hyperactive deficit disorder, autism and neural tube defects;
 - health professionals – medical doctors, surgeons, physicians, psychiatrists, general practitioners, nurses, midwives, public health nurses, other healthcare workers, psychologists;
 - other professionals – teachers, social workers;
 - other person – perpetrators of sexual abuse.

The studies represented populations from the following geographical spread: the Republic of Ireland (60%); Northern Ireland (23%); Northern Ireland and the Republic of Ireland (0.7%); Republic of Ireland and the United Kingdom (6%); the United Kingdom inclusive of Northern Ireland (3%); and international (7%).



Meta-analysis and systematic reviews of specific topic areas are the methodologies frequently employed to summarise current knowledge on specific areas of health, healthcare and health-related interventions. However, mapping the nature of research for a defined population demographic for an entire geo-political entity has not, to the knowledge of the authors, been previously undertaken. Therefore, the findings from this project represent a unique insight into the contemporary nature of child health-related research on the island of Ireland and cover almost a decade of such work. Unexpected findings included identification of a more heterogeneous population group examined in relation to child health research than hitherto anticipated, with children comprising just over 50% of the studied subjects included in this work.

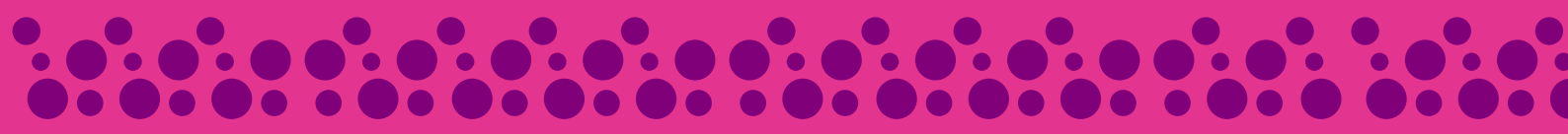
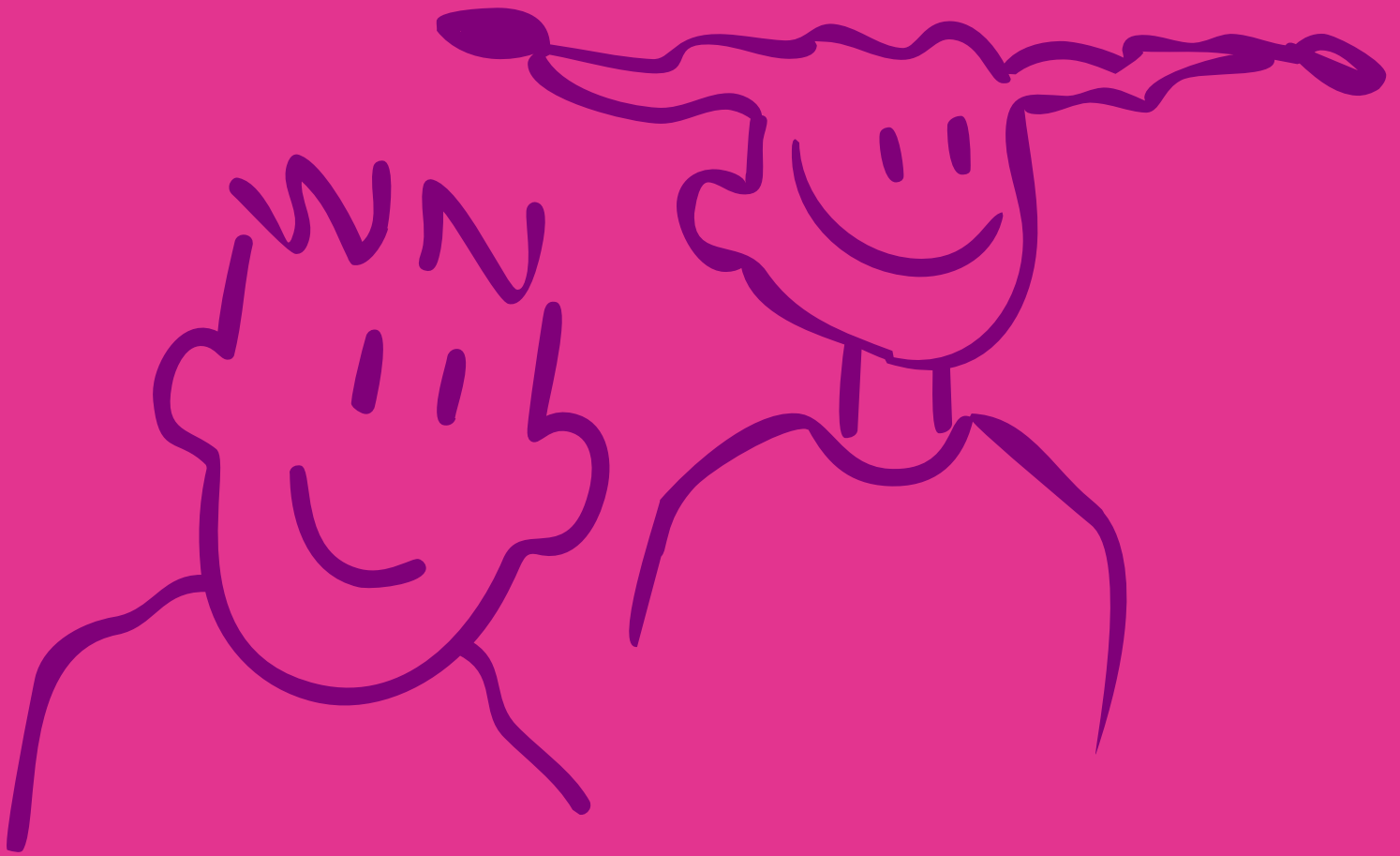
To allow a methodological assessment of the nature of studies, background and definitions are provided on research study types, indexing and classifications systems. The evolutionary nature of research reflecting epidemiological transitions is discussed. Recommendations to achieve more sophisticated and dynamic mapping of health research on children in Ireland are made. The place of research, as a complement to the collection of routine health-related data, is contextualised.

The findings of this report and the database developed from the project provide a rich setting from which to develop clearly stated scientific questions in the area of child health research. It is hoped that the results will be of benefit in developing further work in this area.



1

Background to study



Routine methods of measuring child health

The factors that influence childhood health and development are diverse and reflect genetic composition (Weedon *et al*, 2005), intergenerational, intrauterine (Davey-Smith *et al*, 2007) and early life exposures (Fraser *et al*, 2008). The family–social milieu (Reading and Allen, 1997), political, health and educational structures, together with factors from wider spheres of influences, such as climate conditions (McFarlane, 2010; Morris, 2010), also determine health. Data from international and national population censi and vital statistics databases, stratified by an array of demographic, political and socio-economic factors, provide cross-sectional views on health outcomes by the determinants of health. These health determinants are represented by various indicators of age, sex, socio-economic position, geographical distribution and ethnicity. The sensitivity and specificity (i.e. the precision or accuracy of each factor to measure health) varies according to the indicator selected and the demographics of the population being examined. Publications of trends from these data sources provide information on the effectiveness of political and social policy by measuring secular changes in population health over time (Eurostat, 2009; UNICEF, 2010).

However, the secular changes in health outcomes reported from population censi and survey data are not normally able to illuminate disease aetiology (causality) or changes in the health profile of new, emerging minority groups; neither can they examine the effectiveness of new health technologies. Research studies, with specifically stated, scientifically based questions or hypotheses, are required to understand health-related issues less readily answered by routine data sources.

Research studies are frequently commissioned and often driven by the requests of national governments or advocacy groups. They are commonly descriptive in nature and serve to characterise a specific aspect of, or report on statistical measures of, health not available from routine data sources. Investigator-led research may be more idiosyncratic and focused on disease aetiology. However, in practice, the distinctions between these two types of research are not so clear and there exists varying degrees of overlap between characterising and measuring a health-related outcome and exploring its aetiology.

Time points and time ranges employed in research-based measures of health

Research studies can be cross-sectional, comparative or longitudinal in nature. *Cross-sectional studies*, descriptive in nature, provide a snapshot of current patterns and statistical measures of disease, but are unable to address issues of aetiology. *Comparison studies*, which may also be cross-sectional in nature, allow examination of the magnitude of the statistical measure of health in one population in contrast to another population, with comparators such as gender, ethnicity, geography and time enabling evaluation of the effect of geo-social-political influences. *Longitudinal studies* examine the same population over time and, in this manner, facilitate our understanding of individual-level disease progression through elimination of time or national socio-economic cohort effects.

The plotting of data from repeated cross-sectional studies illustrates trends in population health and disease patterns (McCarthy and Kirke, 2010). Comparison studies provide data on equalities in health between the populations examined with regard to the health determinant of interest. Case control studies, a specific form of comparative study, can illuminate issues of disease aetiology, while longitudinal studies provide information on individual-level trajectories of growth and development, and identify hypotheses regarding determinants of health and disease.



Frameworks for child health research

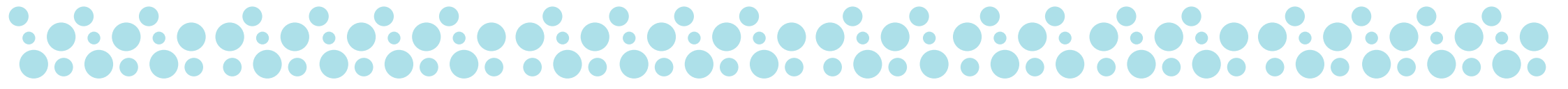
There are several frameworks for the effective organisation of child health research. The epidemiological transition (Omran, 1971) has shifted the major emphasis in understanding disease and health from a germ-based approach, and its associated health interventions, to a focus that includes the examination of a range of biological adaptation processes and over longer time periods (Kuh *et al*, 2003). These focuses range from a biochemical approach to understanding metabolic pathways and cycles, across a genetic approach to understanding the differences between heredity and embryology (Morange, 1998), to the much wider framework of examining health in a social context. A life course approach has been offered as an optimum way of seeking to understand health outcomes by offering an interdisciplinary framework for guiding and structuring research on health, human development and ageing (Kuh, 2002). It is the study of health and its inverse, disease, by considering the long- and the short-term effects of environmental exposures at each stage of development – intrauterine, early childhood, adolescence, young adulthood and later adult life (Kuh, 2004; Ben-Shlomo and Kuh, 2002). That this approach has, for many years, been an intrinsic aspect of several scientific disciplines (including psychology, sociology, demography, anthropology and biology, and, more recently, epidemiology) reflects how the various biological and social factors – independently, additively and multiplicatively – influence physical, mental and emotional well-being.

The relatively recent shift from a medical approach to understanding health (an approach dominated by an adult model of risk assessment) to a multidisciplinary life course perspective reflects appreciation of the complex iterative process whereby individual development is modified and moulded by external stimuli (Odling-Smee *et al*, 2003), the latent period that may exist between exposure and disease, and an understanding of the cumulative effect of repeated exposures on health and disease. Moreover, knowledge that the seeds of much of adult health are determined in early life is premised on clear biologically based hypotheses. It also understands that health is not simply the absence of disease, but is complete physical, social and mental well-being.

One framework by which a life course approach to health can be structured centres on recent work from the field of epidemiology, a discipline which has formalised biologically plausible, hypotheses-driven conceptual models to understand trends in secular diseases and inequalities in health. These conceptual models, illustrated in Figure 1, examine the causal pathway of disease in relation to time (purple), the timing of the causal action (blue) and mechanisms of change (green). There is evidence from the biological sciences that the plasticity of cells and organs in early life makes the intrauterine, infant and early stages of life particularly amenable to influence, with some periods of exposure likely to be of greater aetiological importance than others. The models illustrate these factors by showing the extent to which events help or harm health, the extent to which these effects may be modified, the reliance on the timing on the causal pathway, and the timing of the causal action and the mechanism. The varying effects of time, magnitude, duration and aetiology apply similarly to development of physical, emotional and mental health.



Figure 1: Life course conceptual models of health development (adapted from Ben-Shlomo and Kuh, 2002)



Defining and classifying health and health-related research

The World Health Organization states that ‘*Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*’ (WHO, 1946). However, the shift from what is essentially a philosophical concept of health to developing a logical framework to measure and describe health and health-related research requires the use of precise and valid measurement tools. A range of systems exist by which health outcomes are indexed. The ability of each system to measure what it seeks to measure varies in terms of accuracy, precision, validity, reliability, repeatability and reproducibility. Economic costs, acceptable trade-offs (sensitivity *versus* specificity) and issues of comparability are all determining factors in choosing an indexing system. The tools required to effect good and comparable indexing methods include employment of thesauruses, taxonomies and classification systems. A range of study designs or study types exist by which health-related research can be defined. The ability of each study type to measure what it seeks to measure and to infer from the study findings varies according to the nature of the study population and the presence, or not, of a comparable group.

Thesauruses, taxonomies and classifications

Thesauruses reduce the ambiguity inherent in normal human languages by using predefined vocabularies. Bibliographic databases of peer-reviewed journal articles use specific named thesauruses to address problems of homographs, synonyms and polysemes to achieve bijection (a process where every term can be mapped to another and no unmapped term exists) between concepts and authorised terms.

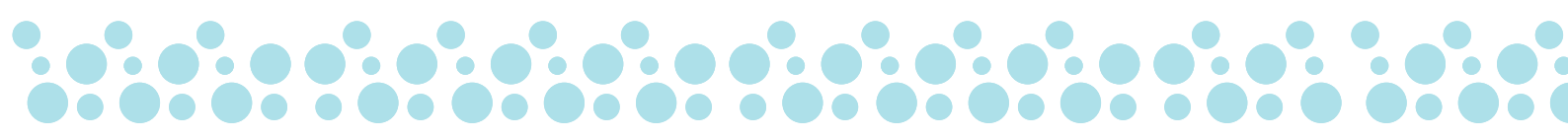
Taxonomy is the practice and science of classification. It allows classification of the factor of interest in a hierarchical structure, with the relationship typically ranked in a supertype-subtype manner. The ordered ranking into appropriate categories is made based on the relationship between the factors of interest. Thus, the nature of the relationship between two factors of interest determines the taxonomy of choice. Most commonly, taxonomy is an empirical science, relying solely on practical experience and classifying only at the final step of the process.

Classifications use ‘*an exhaustive set of mutually exclusive categories which aggregate data at a pre-prescribed level of specialization for a specific purpose*’ and cluster factors of interest according to logical rules (Madden *et al*, 2008). Ideally, a classification should be characterised by (1) *naturalness*: the classes correspond to the nature of the thing being classified; (2) *exhaustiveness*: every member of the group is fitted into one (and one only) class in the system; (3) *usefulness*: the classification is practical; (4) *simplicity*: the subclasses are not excessive; and (5) *constructability*: the set of classes can be constructed by a demonstrably systematic procedure.

The use of each of these methods of defining and classifying health provides a way to organise knowledge for subsequent retrieval.

Study design

Study designs broadly consist of two types – comparative studies and descriptive studies. Studies with a comparative dimension illuminate differences between population groups – for the factor or health-related outcome of interest – according to the characteristics of interest. However, unless confounding is adequately controlled for, alternative explanations for the observed relationship are possible, and are often likely. (Confounding is the presence of an extraneous variable in a statistical model that correlates (positively or negatively) with both the outcome of interest and the factor under examination. Such a variable may, potentially, be the true causal factor in the relationship being examined.) Descriptive studies measure one or more characteristics of a study population, including statistical measures of health. A range of comparative and descriptive study types exist (*see Table 3*). Key features of the major study designs are described below.



Case control studies select their index cases by disease status and match with a control. They can therefore examine only one disease, but many risk factors. This approach is optimal for rare diseases or diseases that take a long time to develop, and allows the examination of a smaller sample size than that required for a cohort study. If well-balanced and equally matched, case control studies can also evaluate confounding and interaction in a reasonably persistent manner. They are also very suitable for transient risk factors, such as infectious diseases. However, because individuals with the disease are recruited to the study, case control studies cannot measure the chance of disease (incidence or prevalence).

Cohort studies follow a group of defined individuals over time to record the instance of disease and thus measure incidence. Their strength lies in their ability to identify the order of happenings. Cohort studies consist of an initially disease-free population and they mimic the condition of an intervention study by providing observation of two groups – those exposed to, or with, the factor of interest and those without. However, since they are neither assigned (i.e. randomly allocated) or match with a control, there may be systematic differences between those with and without the factor of interest over and above that of the exposure being examined. Thus confounding is not controlled for and is often a problem. Well-executed case control studies and cohort studies are the optimum method by which to evaluate disease aetiology.

Comparison studies allow statistical measures of health-related outcomes to be compared between groups. They measure equality between populations. However, as known and unknown confounding factors are not controlled for, they are unable to identify specific causes of aetiology. Nevertheless, such studies can provide evidence for hypothesis generation and a more scientific evaluation of differences and the reasons for these differences between groups.

Case reports describe interesting or unusual occurrence of disease and may form the bases for the generation of hypotheses. However, as they frequently reflect rare or unusual events and, as such, are anecdotal findings, extrapolations from these findings with regard to the general population should not be made.

Case series studies allow examination of the effect of treatment, but due to the nature of selection, they are frequently confounding by selection bias. In addition, the population represents a hospital and not the general population.

Cross-sectional studies, the simplest form of observation study, provide a snapshot of risk factors, exposure and disease status. They measure only the prevalence of disease. They add to the collection of routine data by allowing collection of data of specific interest and the linking of data items person by person. They are most useful as descriptive studies. Issues of sampling and compliance must be considered, and random sampling is required to protect against various biases.

Randomised controlled trials evaluate situations of clinical equipoise and assess the effectiveness of medical procedures and treatments by effectively eliminating confounding, thereby allowing unbiased estimates of effect to be calculated.

The essential characteristic of an **intervention study** is that the investigators assign the ‘treatment’ and observe what happens prospectively. The allocation can be manipulated so the groups are comparable, thus seeking to take account of problems of confounding. However, only randomisation can effectively deal with confounding and interventions studies may suffer from investigator bias.

Some major classifications systems and thesauruses

The list of health-related classification systems and thesauruses is extensive. However, for the purpose of this study, a subset of these indexing systems is presented here, either the most commonly employed in the coding of the retrieved published health-related research or the most appropriate for use in classifying the data in this study. The *World Health Organization Family of International Classifications* (Madden *et al*, 2008) currently consists of two ‘reference classifications’ – the International Classification of Diseases (ICD) and



the International Classification of Functioning Disability and Health (ICF). The ICD-10 consists of 22 blocks of three-digit rubric, each of which is further stratified into four-digit rubric. It is a coding of diseases and signs, symptoms, abnormal findings, complaints, social circumstances and external causes of injury or diseases, as classified by the WHO. It has more than 12,420 different codes and permits tracking of many new diagnoses and procedures, significantly expanding on the 6,969 codes available in the ICD-9.

In addition to these reference classifications, there exists a set of six 'derived classifications'. One of these, the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3), is a multi-axial classification of the site, morphology, behaviour and grading of neoplasms. The topography axis uses the ICD-10 classification of malignant neoplasms (except those categories which relate to secondary neoplasms and to specified morphological types of tumours) for all types of tumours, thereby providing greater site detail for non-malignant tumours than is provided in the ICD-10. In contrast to the ICD-10, the ICD-O-3 includes topography for sites of haematopoietic and reticuloendothelial tumours. The morphology axis provides five-digit codes ranging from M-8000/0 to M-9989/3. The first four digits indicate the specific histological term. The fifth digit after the slash (/) is the behaviour code, which indicates whether a tumour is malignant, benign, in situ or uncertain (whether benign or malignant). A separate one-digit code is also provided for histological grading (differentiation). Electronic versions of the ICD-10 and the ICD-O-3 are available on the WHO website (see www.who.int/classifications/en/).

The Medical Subject Headings (MeSH[®]) is a comprehensive controlled vocabulary for the purpose of indexing journal articles and books in the life sciences; it also serves as a thesaurus that facilitates searching (see www.nlm.nih.gov/mesh/). Created and updated by the United States National Library of Medicine (NLM), it is used by the MEDLINE/PubMed article database and by NLM's catalogue of book holdings. The 2009 version of MeSH contains a total of 25,186 subject headings, also known as descriptors. Most of these are accompanied by a short description or definition, links to related descriptors and a list of synonyms or very similar terms (known as entry terms).

The thesaurus of Psychological Index Terms (PsycINFO[®]) is a database of abstracts of literature in the field of psychology (see www.apa.org/pubs/databases/psycinfo/index.aspx). It is produced by the American Psychological Association. The 11th edition contains more than 8,400 controlled terms and cross-references, which are arranged in hierarchical, alphabetical and by subject arrangements. The records are indexed with the most specific applicable terms. Major and minor terms are assigned, with a maximum of 15 total terms. It has 22 major categories and 135 subcategories. Each record is assigned to one or two classifications.

The Cumulative Index to Nursing and Allied Health Literature (CINAHL[®]) is an index of English-language and selected other-language journal articles about nursing, allied health, biomedicine and healthcare (see www.ebscohost.com/cinahl/). These subject headings were developed to reflect the terminology used by nursing and the allied health professionals. CINAHL subject headings follow the structure of the Medical Subject Headings (MeSH) used by the US National Library of Medicine. This structure has been used to develop 12,714 CINAHL subject headings.

Limitations to understanding health-related research through the classification of health-related outcomes

Classifications facilitate data comparison on health outcomes within and between populations, but provide only limited information on health determinants, a major area of interest when seeking to understand and index health-related research. At a high level of aggregation, health determinants can be grouped under four main factors: socio-economic factors, environmental factors, health behaviours or practices factors, and biomedical and genetic factors. The specific indicator employed in quantifying the health determinants of interest differs according to the required levels of sensitivity and specificity. For example, when reporting



on inter-country population health, taking account of socio-economic status, gross measures such as Gross National Income (GNI) per capita or debt services can be employed to report on the relationship between socio-economic status and health status at a national level. However, when reporting on intra-country population health, more sensitive measures are required, with individual-level outcomes reported stratified by an occupation, or educational, measure of socio-economic position. However, currently it appears that only nationally representative measures of some health determinants (such as socio-economic position) exist. This limits the ability to classify these indicators in a manner that facilitates international comparison.

Identifying health-related research

The findings from specific hypotheses and scientific-based questions are presented in publications termed 'grey literature' and 'peer-reviewed literature'. Peer-reviewed literature is literature that has undergone the scrutiny of other experts in the same field and is generally – and for the purpose of this study, always – published in national and international scientific journals. Grey literature refers to literature not obtained through conventional channels such as publishers, *'but which is frequently original and usually recent'* (Debachere, 1995). Frequently, but not definitively, journal publications represent findings that have a wider focus of interest, often beyond national boundaries, while grey literature reports findings of a more local significance.

Aim of study

The aim of this study was to determine the nature and typography of contemporary Irish child health research. The potential areas for examination included:

- examination of data from routine health information systems (e.g. population census, vital statistics, primary care statistics, hospital statistics (the Hospital In-Patient Enquire (HIPE) system) or other registers (such as the cancer register), EUROCAT and the disabilities information systems);
- examination of the grey literature;
- examination of the peer-reviewed papers published in scientific journals.

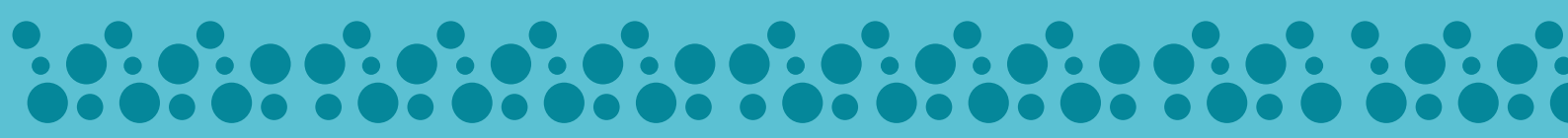
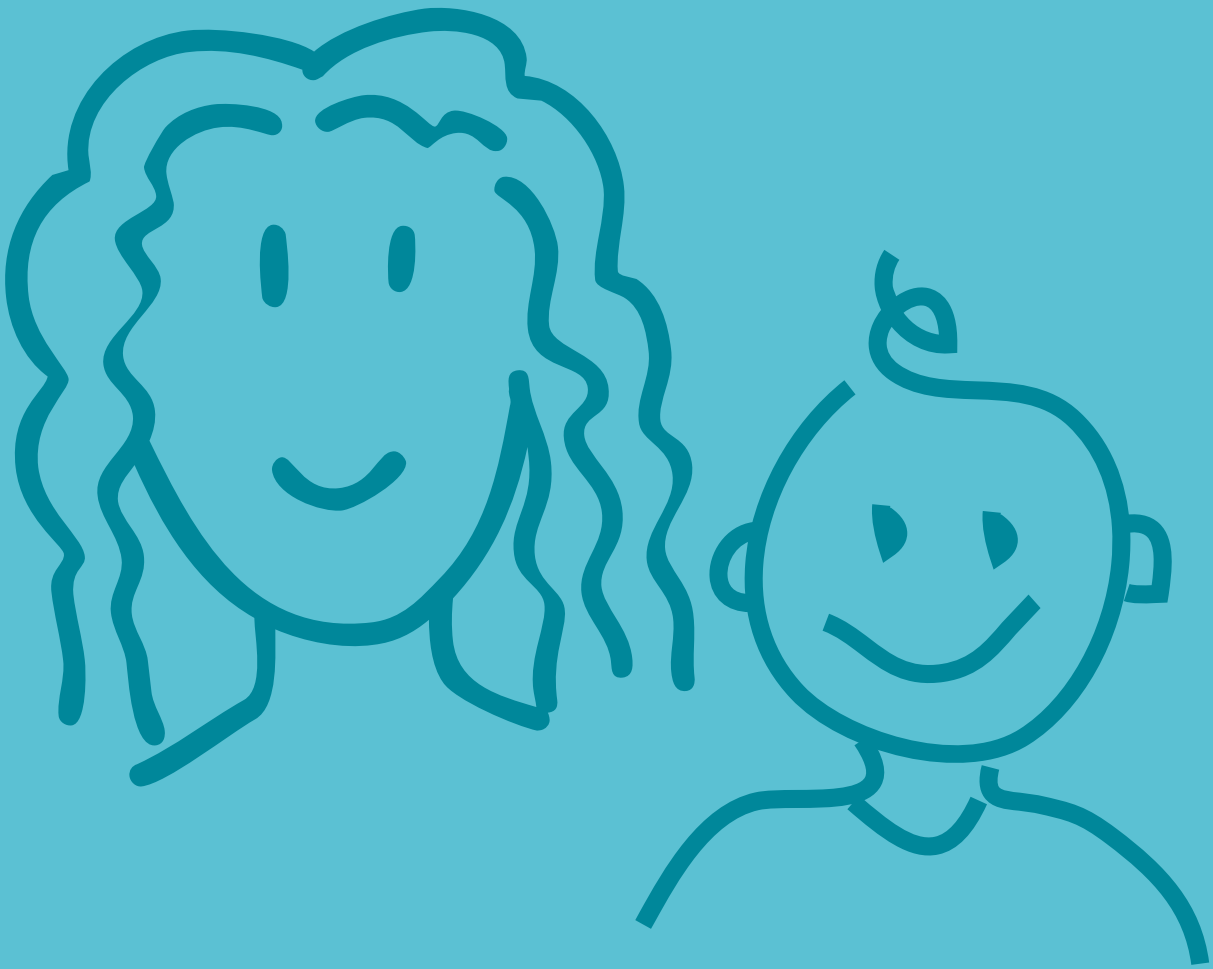
For the purpose of this study, research was defined as work reviewed in bibliographic databases of papers from peer-reviewed scientific journals. The age range for children considered for inclusion in the study spanned the period from conception up to 18 years of age. The time range for which peer-reviewed papers were retrieved spanned the years 2000 to 2008. Initially, the literature review covered work from the Republic of Ireland, but the remit was broadened to cover the island of Ireland. The data from this study, including full references for all of the peer-reviewed literature, are located on the website www.childrensdatabase.ie/Irish-child-health-database/. Tags of the specific characteristics by which these study papers were examined (*see Chapter 3, Results*) are also available on the website and each paper has a short statement (255 alphabetic characters or less) on the aims and objectives of the study or paper. Where possible, the original statement of the paper's author was transcribed. However, for almost 50% of the papers, no clear statement of purpose was made and in these instances, the present authors have drafted a statement summarising the aims and objectives as understood by them.

The present study was undertaken by the Child Health Epidemiology Unit of the Health Research Board, Dublin, in collaboration with the Office of the Minister for Children and Youth Affairs of the Department of Health and Children. This report represents a brief synopsis of the study's findings, an interpretation of these findings and recommendations on areas for consideration when planning health research on children for the future. The full findings of the study can be found on www.childrensdatabase.ie/Irish-child-health-database/.



2

Methods



Introduction

Six bibliographic databases – MEDLINE, PsycINFO, SocINDEX, CINAHL, EMBASE and ScienceDirect – were searched to identify all published papers associated with health-related research on children in Ireland. Potentially significant papers were downloaded into the management reference package EndNote® and examined for relevance. Abstracts or full papers were screened. The criteria for inclusion or exclusion in the study were refined. Papers deemed eligible for the study were examined to determine:

1. paper type (study article or other commentary);
2. study nature (i.e. the nature of the study – analytical or descriptive);
3. study type (e.g. case report, cross-sectional study, randomised control trial);
4. topic area (classified to ICD-10, ICO-O-3 or themed and grouped under 23 health categories where these outcomes were not classifiable by ICD-10 or ICO-O-3);
5. demographic characteristics, including person type, population type and population geographical region.

Bibliographic databases

The bibliographic databases, a description of their contents and the specific thesaurus employed by their operating organisation are detailed in Table 1. The six EndNote databases were merged into one and electronically identified duplicates were deleted.

Table 1: Bibliographic databases of peer-reviewed scientific literature, main content description and thesaurus used in each database

DATABASE	CONTENT DESCRIPTION	SEARCH ENGINE	THESAURUS
MEDLINE	Life sciences with a concentration on biomedicine	PubMed	Medical Subject Headings (MeSH)
PsycINFO	Psychology and related behavioural and social sciences	EBSCO	Thesaurus of Psychological Index Terms
SocINDEX	Sociology, encompassing all sub-disciplines and closely related areas of study	EBSCO	Sociology Thesaurus
CINAHL	Nursing and allied health disciplines	EBSCO	CINAHL subject headings
EMBASE	Biomedicine and pharmacology	<i>not applicable</i>	EMTREE
ScienceDirect	Science, technology and medicine	<i>not applicable</i>	<i>not applicable</i>

Study criteria

The criteria for papers included in the study are detailed in Table 2. Papers identified using these criteria, but deemed not eligible for the study, as detailed in the exclusion criteria, were excluded from subsequent analysis.



Inclusion criteria

Table 2: Inclusion criteria

DESCRIPTOR	DESCRIPTOR DETAILS
Databases	MEDLINE, PsycINFO, SocINDEX, CINAHL, EMBASE, ScienceDirect
Timeframe	1st January 2000 to 19th November 2008
Papers	Peer-reviewed published journal articles
Search terms*	'Neonate', 'Infant', 'Child', 'Children', 'Ireland', 'Irish'
Age group	Children up to and inclusive of 18 years of age
Geography	Children studied <i>in</i> Ireland
Other population groups	Parents, health professionals, educationalists or other persons whose knowledge, practice or actions impacted on children's health or well-being
Animal studies	Including conditions that commonly occur in childhood, but where ethical or other considerations prevent or limit human studies
Other	Studies that evaluated the effectiveness and efficiency of procedures utilised in providing healthcare to children

* The search terms were combined to create a set of citations relevant to the area under investigation using the Boolean logic operators 'AND', 'OR' and 'NOT' with search terms such as 'Ireland AND Neonate', 'Ireland OR Irish AND Child', 'Ireland AND Child OR Children'.

Exclusion criteria

Papers tangential to the study: For example, instances where the search terms yielded papers where medical equipment manufactured in Ireland was cited, or where the first, other author or institution had the word 'Ireland' or 'Irish' in their name.

Papers on study populations outside of Ireland: Irish children studied outside of Ireland, such as migrant children or offspring of Irish parents in another country.

Papers reporting early life exposures and adult outcomes: Outcomes resulting from early life, childhood or adolescent exposures examined in adulthood.

Screening, grouping and classifying study papers, study topics and study population

Initially, study papers were divided into one of two sets:

- **Set 1** consisted of papers that discussed aspects of health research on children, but were not individual studies. This set included discussion papers, reviews, commentaries and letters, in addition to a small number of errata or abstracts on conference proceedings..
- **Set 2** consisted of papers reporting research findings. Papers in Set 2 were further stratified into the following groups:
 1. the nature of the study subjects;
 2. research type;
 3. methodology employed;
 4. study type – defined and ranked by strengths and weaknesses of study type;
 5. study topic area;
 6. population characteristics.

1. **The nature of the study subjects** included both humans and animals. Papers reporting findings from animal studies were retained in the electronic database, but not subjected to further analysis in this report.
2. **The research type** was defined as primary or secondary; secondary research reported findings from systematic reviews or meta-analyses. Papers reporting findings from systematic reviews or meta-analysis studies were retained in the electronic database, but not subject to further analysis.
3. **Methodology employed** was defined as analytical or descriptive. Studies adopting an analytical approach posed and tested hypotheses. Studies of a descriptive nature reported the characteristics or the magnitude of the outcome of interest, but did not specifically examine disease aetiology. The descriptive studies were sub-grouped as follows:
 - 3.1 those with a comparative dimension (time, geography, procedure or treatment);
 - 3.2 those without a comparative dimension;
 - 3.3 those measuring aspects of effectiveness;
 - 3.4 those with a health technology dimension (HTA).

Analytical studies consisted of case control studies and cohort or longitudinal studies. Case control studies compare two subject groups: cases and controls. They are suitable for generating and testing hypotheses. Ideally, cases and controls are matched for a range of characteristics. However, in practice, this was not observed in all cases. Some studies matched for demographic characteristics, such as age and gender. In other studies, no matching was undertaken. Cohort and longitudinal studies follow up sub-groups of their population to detect difference in outcomes between groups who experience different exposures. However, while cohort studies provide strong evidence regarding disease aetiology, the inability to control for confounding variables limits inference regarding causality.

Descriptive studies describe the characteristics of a population without a control group. They are therefore unable to test, but may generate, hypotheses. Descriptive studies with a comparative dimension compare the characteristics of interest in the studied population with findings from populations from a different cultural, geo-political or socio-economic background. Studies measuring aspects of effectiveness describe the characteristics of a population taking account of best practice (as in audit studies), professional or parental knowledge or practice, the effectiveness of the intervention, or the validation of a methodology. Studies with a health technology dimension measure treatments or tests used by those working in the health services to promote health prevention and treat disease.

4. **Study types** were defined using definitions from Last's (1995) *A Dictionary of Epidemiology*. Study type definitions are presented in Table 3. The strengths and weaknesses of the various study types are presented in Table 4. A small number of studies identified in the literature review were not well explained by classic definitions. In these instances, a working definition has been supplied by the authors of this report. Both the classic and working definitions are fully referenced in the table of definitions (*see Table 3*). In the present study, papers were grouped, not classified, by these definitions. Groupings were undertaken under a 'most suitable' rationale, which was subjective in nature and the opinion of the authors.



5. **Study topics**, where possible, were classified according to internationally recognised outcomes of health and disease. Mostly, this consisted of the ICD-10 three- or four-digit rubric. The 22 ICD-10 four-digit rubric blocks are detailed in Table 5. The more detailed four-digit rubrics are presented in the actual tables of results in Chapter 3 of this report.

A range of conditions did not directly map to ICD-10's four-digit rubric, but reflected outcomes best grouped within these classifications. These included conditions under:

O00 – O99 Pregnancy, childbirth and the puerperium.

P00 – P96 Certain conditions originating in the perinatal period.

To allow for differential between the more accurate classification methodology and the less precise 'grouping' under the ICD rubric classifications, these are indicated within the actual tables of results in Chapter 3 as:

□ for actual classifications which directly map the four-digit rubric of ICD-10;

** for 'grouped' classification for which there is not a corresponding four-digit rubric in ICD-10.

A small number of studies were classified to the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3). Table 6 gives examples of the morphology axis of this classification system.

Papers downloaded from the various bibliographic databases are tagged with keywords by the coders of the various databases from which they are retrieved. The original key words assigned by the coders are based on the individual thesaurus used by the specific bibliographic database. These were retained in the study database and serve to identify key factors of the papers. However, there is some variation in the manner of coding differences across the various bibliographic databases. It was decided to group the remaining non-classified outcomes under a range of themed outcomes to aid in understanding the nature of the research. A thematic approach resulted in 23 additional categories. These included health-related outcomes grouped under the following headings: (1) microscopic organisms; (2) immunology; (3) neurology; (4) psychology; (5) sociology; (6) drugs; (7) breastfeeding; (8) deaths; (9) disabilities; (10) health services; (12) organ transplants; (13) syndromes; (14) prematurity; (15) anatomy; (16) growth and development; (17) diet and lifestyle; (18) physical activity; (19) education; (20) dental; (21) biological markers; (22) legal issues; and (23) other.

Because this approach to grouping the outcomes is not reliant on a recognised indexing system, the working definitions of groupings are given in Table 7. This is a subjective grouping, arising from the use of natural language, indexing language and free indexing language, rather than the use of a controlled indexing language from a specified thesaurus. The specific words or terms used by the authors of the original papers were retained and reported in the actual tables of results in Chapter 3, to allow alternative interpretation of the defined grouping as described by the authors of this report.



6. **Population characteristics** consisted of person type, population type and geographical region of the study population.
- The **person type population** consisted of:
 - children-only populations;
 - mother and infant populations;
 - children and adults populations;
 - children, with or without 'Other' population types. The group 'Others' consisted of parents and/or other family members; health, health-related and other professionals working with children; and sex offenders.
 - The **population type population** consisted of:
 - hospital-based populations;
 - community-based populations;
 - schoolchildren populations.
 - The **geographical region population** consisted of:
 - Republic of Ireland;
 - Republic of Ireland and the United Kingdom (including Northern Ireland);
 - Northern Ireland and Republic of Ireland only;
 - Northern Ireland only;
 - United Kingdom (including Northern Ireland);
 - international (Ireland and one or more countries outside of the United Kingdom; these countries were predominantly European);
 - a small number of studies were grouped as United States of America or Scotland, where some aspects of the geographical origins of the population were not clear.

Research study groups

An additional area of interest in understanding the current picture of child health research, but which is not examined in further detail in this report, was identified from the study papers. This is a list of various research study groups. The identified groups are listed in Appendix 1 of this report under national research groups, research groups of Ireland, the United Kingdom and European and international study groups.



Table 3: Study type definitions (adapted from Last, 1995)

STUDY TYPE	DEFINITION
Case control study	Papers reporting observational epidemiological study of persons with the disease (or other outcome variable) of interest and a suitable control (comparison, reference) group of persons without the disease. The relationship of an attribution to the disease is examined by comparing the diseased and non-diseased with regard to how frequently the attribute is present or, if quantitative, the levels of the attribute, in each of the groups.
Cohort and Longitudinal studies	Papers reporting an analytical method of epidemiology study in which subsets of a defined population can be defined who are, have been, or in the future may be, exposed or not exposed, or exposed in different degrees, to a factor or factors hypothesised to influence the probability of occurrence of a given disease or other outcome. The main feature of a cohort study is observation of large numbers over a long period (commonly years) with comparison of incidence rates in groups that differ in exposure levels (syn: concurrent, follow-up, incidence, longitudinal, prospective study). For the purpose of this study, papers identified as cohort papers represent cohorts for which the data are not yet representative of longitude analysis. They are, in methodology, cross-sectional in nature. The alternative terms for a cohort study (i.e. follow-up, longitudinal and prospective study) describe the essential feature of the method and report observations of the population for a sufficient number of person-years to generate reliable incidence or mortality rates in the population subsets. This generally implies study of a large population, study for a prolonged period (years), or both.
Comparison study	Papers reporting a group with which the statistical measures of the outcomes of interest in the index group are compared with those of an external population. Comparison undertaken in papers reported on in this study included internal and external population group comparisons, over time and across geographical regions.
Epidemiology – incidence, prevalence and/or trends	Papers reporting a specific statistical measure of disease occurrence – incidence, prevalence, or trends of these measures – or (of) other health-related characteristics in human populations. Generally, observations concerned the relationship of disease to basic characteristics, such as age, sex, race, geographical location, occupation and social class. Incidence: The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population. More generally, the number of new events, e.g. new cases of a disease in a defined population, within a specified period of time. Prevalence: The number of events, e.g. instances of a given disease or other condition in a given population at a designated time; sometimes used to mean prevalence rates. When used without qualification, the term usually refers to the situation at a specified point in time (point prevalence). Trends: A long-term movement in an ordered series, e.g. a time series. An essential feature is that the movement, while possibly irregular in the short term, shows movement consistently in the same direction over the long term.
Case report	Papers reporting a case report (in medicine), a detailed report of the symptoms, signs, diagnosis, treatment and follow-up of an individual patient. They contain a demographic profile of the patient, but usually describe an unusual or novel occurrence in one of the following categories: (1) an unexpected association between diseases or symptoms; (2) an unexpected event in the course of observing or treating a patient; (3) findings that shed new light on the possible pathogenesis of a disease or an adverse effect; (4) unique or rare features of a disease; (5) unique therapeutic approach. A case report is a type of anecdotal evidence. As such, it is less scientifically rigorous than controlled clinical data involving a larger sample size.
Case study	Papers reporting an intensive study of a single group, incident, or community . Rather than using samples and following a rigid protocol to examine limited number of variables, case study methods involve an in-depth, longitudinal examination of a single instance or event: a case. They provide a systematic way of looking at events, collecting data, analysing information and reporting the results. Case studies lend themselves to both generating and testing hypotheses. It is a research strategy, an empirical inquiry that investigates a phenomenon within its real-life context.
Cross-sectional study	Papers reporting a study that examines the relationship between disease (and other health-related characteristics) and other variables of interest as they exist in a defined population at one particular time (syn: disease frequency survey, prevalence study). The presence or absence of disease and the presence or absence of the other variables (or, if they are quantitative, their level) are determined in each member of the study population or in a representative sample at one particular time. The relationship between a variable and the disease can be examined (1) in terms of the prevalence of disease in different population subgroups defined according to the presence or absence (or level) of the variables; and (2) in terms of the presence or absence (or level) of the variables in the disease <i>versus</i> the non-diseased.

Table 3: Study type definitions (*continued*)

STUDY TYPE	DEFINITION
Surveillance study	Surveillance studies are studies with continuous analysis, interpretation and feedback of systematically collected data, generally using methods distinguished by their practicality, uniformity and rapidity, rather than by accuracy or completeness.
Case series	A case series (or clinical series) is an observational medical research study that tracks patients with a known exposure given similar treatment or examines their medical records for exposure and outcome. Retrospective or prospective, it usually involves a small number of patients. Case series may be consecutive or non-consecutive, depending on whether all cases presenting to the reporting authors over a period of time were included or only a selection. They are frequently confounded by selection bias, limiting statements on the causality of correlations observed.
Audit	Audit papers are papers that measure the extent of implementation of best practice as defined by research or expert opinion. Inclusion criteria for an audit are defined as (1) addressing a healthcare topic; (2) developing an audit standard; (3) evaluating actual practice; (4) comparing practices against the standard. The final criterion of audit is (5) the dissemination of information and re-audit (O’Gorman, 2007).
Practice or knowledge of health professional or parent	Papers reporting studies grouped under this heading reported on diseases, treatments or healthcare procedures experienced by children, where the knowledge, application of best practice guidelines and/or practice norms, executed by health and health-related personnel (including teachers and parents), were examined. (<i>Authors’ own working definition</i>)
Intervention study	Papers reporting on investigations involving intentional change in some aspect of the status of the subjects (e.g. introduction of a preventive or therapeutic regimen) or designed to test a hypothesized relationship.
Validation study	Papers reporting on a process involved in establishing that the method under examination is sound for the purpose for which it is being used.
Other studies – measuring effectiveness of tools	Studies related to the effectiveness of measurement tools, where a measure of sensitivity or specificity was not specifically reported. (<i>Authors’ own working definition</i>)
Screening study	The presumptive identification of unrecognised disease or defect by the application of tests, examinations or other procedures that can be applied rapidly. Screening tests are not diagnostic.
Economic study	Studies that use, in some measure, a decision model incorporating cost, relative effectiveness and valuations of health statuses (utilities) for different treatment models.
Sensitivity and specificity of a measurement tool	Papers that examine the sensitivity or specificity of a measurement tool. Sensitivity is the proportion of truly diseased (or positive) findings in a screened population; it is a measure of the probability of correctly diagnosing a case or the probability that any given case will be identified by the test. Specificity is the proportion of truly non-diseased (or negative) findings that are so identified by the screening test; it is a measure of the probability of correctly identifying a non-diseased person with a screening test. (<i>Authors’ own working definition compiled from Last’s definitions of sensitivity and specificity</i>)
Randomised controlled trial	Papers reporting on an epidemiological experiment in which subjects in a population are randomly allocated into groups, usually called study and control groups , to receive or not to receive an experimental preventive or therapeutic procedure, manoeuvre or intervention. The results are assessed by rigorous comparison of rates of disease, death, recovery or other appropriate outcome in the study and control group, respectively.
Qualitative studies	Papers reporting on observation or information characterised by measurement on a categorical scale (i.e. a dichotomous or nominal scale) or if the categories are ordered, an ordinal scale. These included ethnographic studies – papers reporting on the gathering of empirical data on human societies/cultures; data collection is often done through participant observation, interviews and questionnaires; focus group study – studies of qualitative research in which a group of people are asked, interactively, about their perceptions, opinions, beliefs and attitudes towards a product, service, concept or idea. They also included anthropology studies – papers reporting on ‘the study of humanity’; methods vary according to the anthropology specialty: (1) biological or physical anthropology; (2) social anthropology or cultural anthropology; (3) archaeology; and (4) anthropological linguistics.
Legal notes	Studies that address topic areas with a civil law dimension. (<i>Authors’ own working definition</i>)

Table 4: Study type – strengths and weaknesses (adapted from Susser *et al*, 2006)

METHODOLOGY	STUDY TYPE	STRENGTHS	WEAKNESSES
ANALYTICAL studies	Case control study	Relatively straightforward	No randomisation potential for bias and confounding
	Cohort and Longitudinal studies	The exposure predates the outcome	Can be expensive to maintain and subject to high attrition
DESCRIPTIVE studies	Comparison study	Allows comparison of characteristics between groups	Cannot distinguish cause and effect
	Epidemiology – incidence, prevalence and/or trends	Allows examination of the occurrence of new disease, the number of persons in the population with disease and changes in the occurrence of disease with time	Not possible to test hypotheses since there is no comparison group and with regard to incidence and prevalence cannot distinguish cause and effect
	Case report	Cheap and easy way of generating hypotheses	Liable to coincidence, error, bias and confounding
	Case study	Cheap and easy way of generating hypotheses	Liable to coincidence, error, bias and confounding
	Cross-sectional study	Identifies patterns of disease	Cannot distinguish cause and effect
	Surveillance study	Identifies prevalence and frequency of disease	Cannot distinguish cause and effect
	Case series	May be the best information on very rare diseases	No comparison group, so cannot test hypotheses
	Audit	Gives information on service delivery	Unreliable estimates of effectiveness
	Practice or knowledge	Gives information on knowledge of health delivery	Unreliable estimates of the application of knowledge
	Intervention study	Gives information on whether an intervention can work	Cannot explore all issues that determine if an intervention will work
	Other studies – mainly related to measuring effectiveness of tools	Quantifies the effectiveness of a tool to measure what it intends to measure	Estimates on the sensitivity or specificity of the measurement tool not provided
	Validation study	Quantifies sensitivity and specificity of the process being validated	Caution needs to be applied in extrapolating findings to a wider context
	Screening study	Allows assessment of the approximate magnitude of disease in a population	Is not diagnostic
	Economic study	Allows quantification of the cost implication of procedures or treatment	Data derived from static economic modelling reflect specific conditions
	Sensitivity and specificity of a measurement tool	Quantifies the effectiveness of a tool to measure what it intends to measure	The recorded sensitivity and specificity of the measurement tool apply only to the specific circumstances in which they were gauged, thus care should be taken in extrapolating findings
	Randomised controlled trial	Randomisation reduces selection bias and confounding	Expensive and time-consuming
Qualitative study	Can illuminate complex issues	May be unreliable	

Table 5: International Classification of Disease, Version 10 (ICD-10), three-digit rubric

BLOCK	THREE-DIGIT RUBRIC
A00-B99	Certain infectious and parasitic diseases
C00-D48	Neoplasms
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism
E00-E90	Endocrine, nutritional and metabolic diseases
F00-F99	Mental and behavioural disorders
G00-G99	Diseases of the nervous system
H00-H59	Diseases of the eye and adnexa
H60-H95	Diseases of the ear and mastoid process
I00-I99	Diseases of the circulatory system
J00-J99	Diseases of the respiratory system
K00-K93	Diseases of the digestive system
L00-L99	Diseases of the skin and subcutaneous tissue
M00-M99	Diseases of the musculoskeletal system and connective tissue
N00-N99	Diseases of the genitourinary system
O00-O99	Pregnancy, childbirth and the puerperium
P00-P96	Certain conditions originating in the perinatal period
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
S00-T98	Injury, poisoning and certain other consequences of external causes
V01-Y98	External causes of morbidity and mortality
Z00-Z99	Factors influencing health status and contact with health services
U00-U99	Codes for special purposes

Table 6: Examples of axes of classification and coding strata within these axes in the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3)

ONCOLOGY AXES	OUTCOMES classified to the ICD-O-3
1.1 Morphology	1.1.1 (8000-8009) Not otherwise specified
	1.1.1.2 (8010-8790) Epithelial
	1.1.1.3 (8800-9370) Connective tissue
	1.1.1.4 (9380-9589) Nervous system
	1.1.1.5 (9590-9999) Hematologic (leukemias, lymphomas and related disorders)
	1.1.1.6 – Lymphoid leukemias and related disorders
	1.1.1.7 – Myeloid leukemias and related disorders
	1.1.1.8 – Other
1.2 Topography	The topography axis is for the topographical codes of the tumour's site. It is standardised with the C section of ICD-10.

Table 7: Study type – themed, non-classifiable, health-related outcomes with working definitions

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	WORKING DEFINITIONS
(1) MICROSCOPIC ORGANISMS	Includes bacteria, viruses, fungi, and antibiotic resistant organisms
(2) IMMUNOLOGY	Outcomes related to physiological functions of the immune system
(3) NEUROLOGY	Neurological-related outcomes
(4) PSYCHOLOGY	Outcomes of a psychological nature, with psychology defined as ‘the scientific understanding of human mental functions – such as perception, introspection, memory, creativity, imagination, conception, belief, reasoning, volition, emotion – and behaviours’
(5) SOCIOLOGY	Outcomes of a sociological nature, with sociology defined as ‘the development and refinement of a body of knowledge about human social activity. A process which endeavours to unify history, psychology and economics through the scientific understanding of the social realm’
(6) DRUGS	Outcomes related to drugs, including licit (e.g. tobacco or alcohol), illicit (e.g. cocaine) and prescribed pharmacological preparations (e.g. prescribed by a medical practitioner)
(7) BREASTFEEDING	Outcomes related to breastfeeding – including the nature, type, duration, and barriers and supports to same
(8) DEATHS	Death-related outcomes where the specific cause of death was not specified
(9) DISABILITIES	Disability-related outcomes where the specific cause of disability was not specified
(10) HEALTH SERVICES	Health service provision, utilisation or uptake rates
(11) MEDICAL PROCEDURES	Medical procedures, including surgical, medical, treatment and imaging
(12) ORGAN TRANSPLANTS	Health outcomes among organ transplant recipients
(13) SYNDROMES	Conditions of a syndromic nature, with syndromes defined as ‘the association of several clinically recognisable features, signs and symptoms, where the presence of one feature can alert the physician to the presence of other features’
(14) PREMATUREITY	Health outcomes in pre-term infants. The time point at which the outcome is examined may be at the time of birth or in later childhood
(15) ANATOMY	Anatomical structures where a specific disease or pathology is not named
(16) GROWTH AND DEVELOPMENT	Normal and abnormal growth patterns – including anthropological measures, neurological measures and psychological measures of growth and development
(17) DIET AND LIFESTYLE	Papers where the topic area examines aspects of diet and lifestyle
(18) PHYSICAL ACTIVITY	Papers where the topic area examines areas of physical activity
(19) EDUCATION	Papers where the topic area reports on formal and informal education
(20) DENTAL	Papers where the topic area reports on dental issues
(21) BIOLOGICAL MARKERS	Papers where the topic area reports on biological markers, not classifiable by ICD-10
(22) LEGAL ISSUES	Papers where the topic area reports on issues with a legal dimension
(23) OTHER	Outcomes not elsewhere grouped



3 Results



Introduction

The study search terms identified 5,516 peer-reviewed published papers across the six bibliographic databases (*see Chapter 2 for details*). Of these, 796 were duplicates and were deleted. Each of the 4,720 remaining papers was examined with reference to the study inclusion/exclusion criteria and 3,229 papers (59%) were identified as eligible for inclusion in the study. These papers represented reports from a total of 1,003 national and international scientific journals (*see Appendix 2*).

Of the 3,229 eligible papers, 977 (30%) were papers reporting commentaries, reviews, editorials or letters, and are the component papers of Set 1. These articles were retained in the electronic database (available on the website www.childrensdatabase.ie/Irish-child-health-database/), but were not examined further for this study.

Set 2 consisted of 2,252 papers (70%) reporting research findings, including 69 papers (3.2%) reporting primary research on animals, as well as findings from 25 systematic reviews (1.1%) and 2 meta-analyses (0.09%). Individual research studies with findings on humans were retained in the database, but were not examined further for this study (*see Figure 2*).

The remaining 2,156 papers (67% of the 3,229 eligible papers) reported research findings on humans, mainly from primary research studies (*see Figure 3*). These papers consisted of 209 analytical studies (9.7%), 1,941 descriptive studies (90%) and 6 papers of a 'legal' nature (0.03%).

Note: The figure 2,156 represents the reference baseline for numbers reported in Figure 3 and the subsequent reporting of findings in Tables 8-47. Percentages accompanying reported counts are rounded and may thus vary by up to 1% from expected totals.

The **209 analytical studies** (approx. 10%) consisted of:

- 163 case control studies (7.5%);
- 46 cohort or longitudinal studies (2%).

The **1,941 descriptive studies** (approx. 90%) consisted of:

- 250 comparison studies or epidemiology studies of incidence, prevalence and/or trends of diseases (11.5%);
- 1,262 studies without a comparative group (58.5%), consisting of 302 case reports, 664 case studies, 57 cross-sectional studies, 16 surveillance studies and 223 case series studies;
- 187 studies measuring aspects of effectiveness (8.7%);
- 140 studies examining aspects of health technology assessment (6.5%);
- 102 qualitative studies (4.7%).

Figure 2 summarises the papers retrieved from the study databases and their subsequent screening and eligibility in the study, while Figure 3 details the individual study types and the number of papers examined within each of these groupings.



Figure 2: Number of papers retrieved from study databases, number of papers removed following screening and number of papers eligible for inclusion in the study

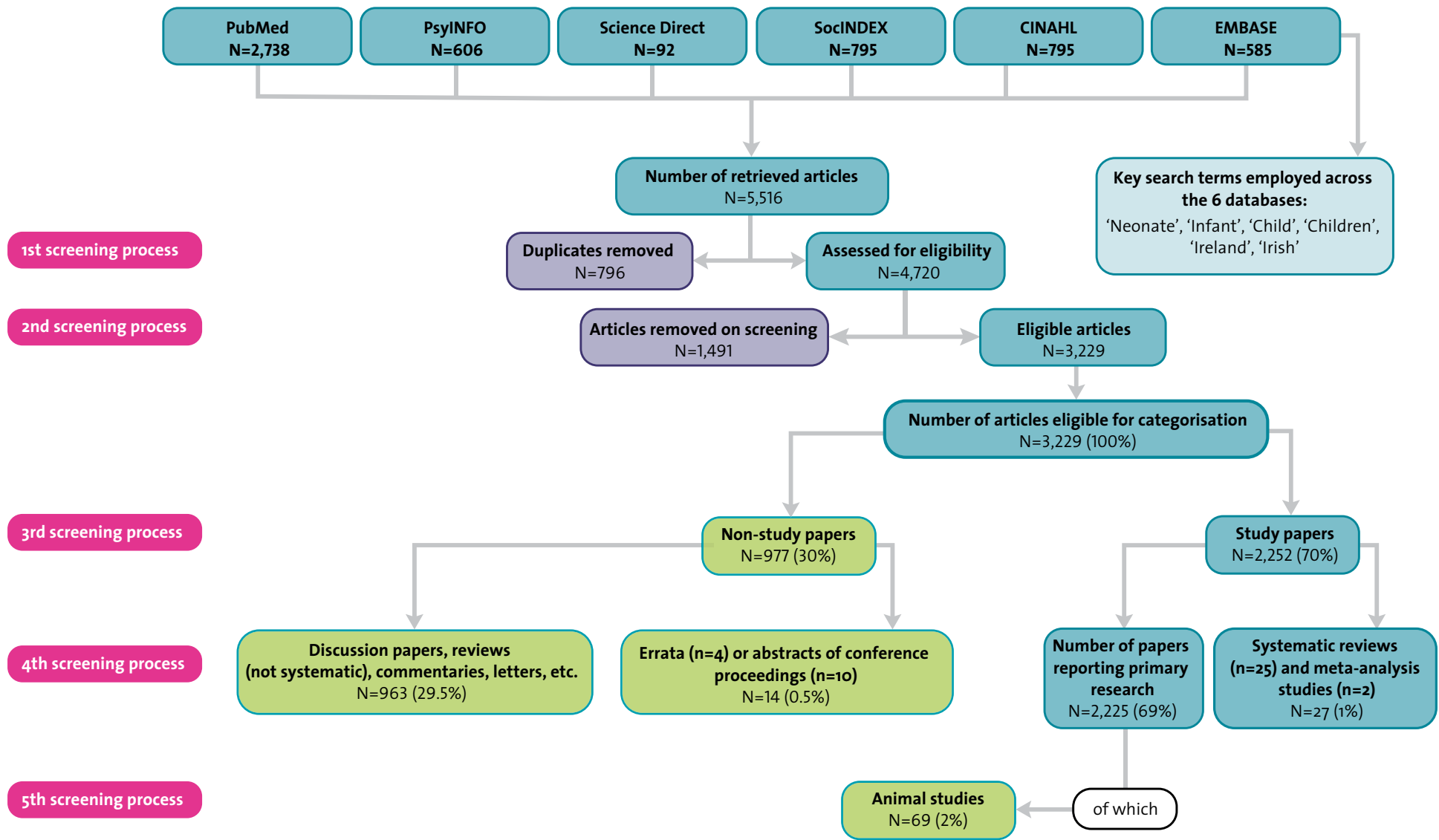
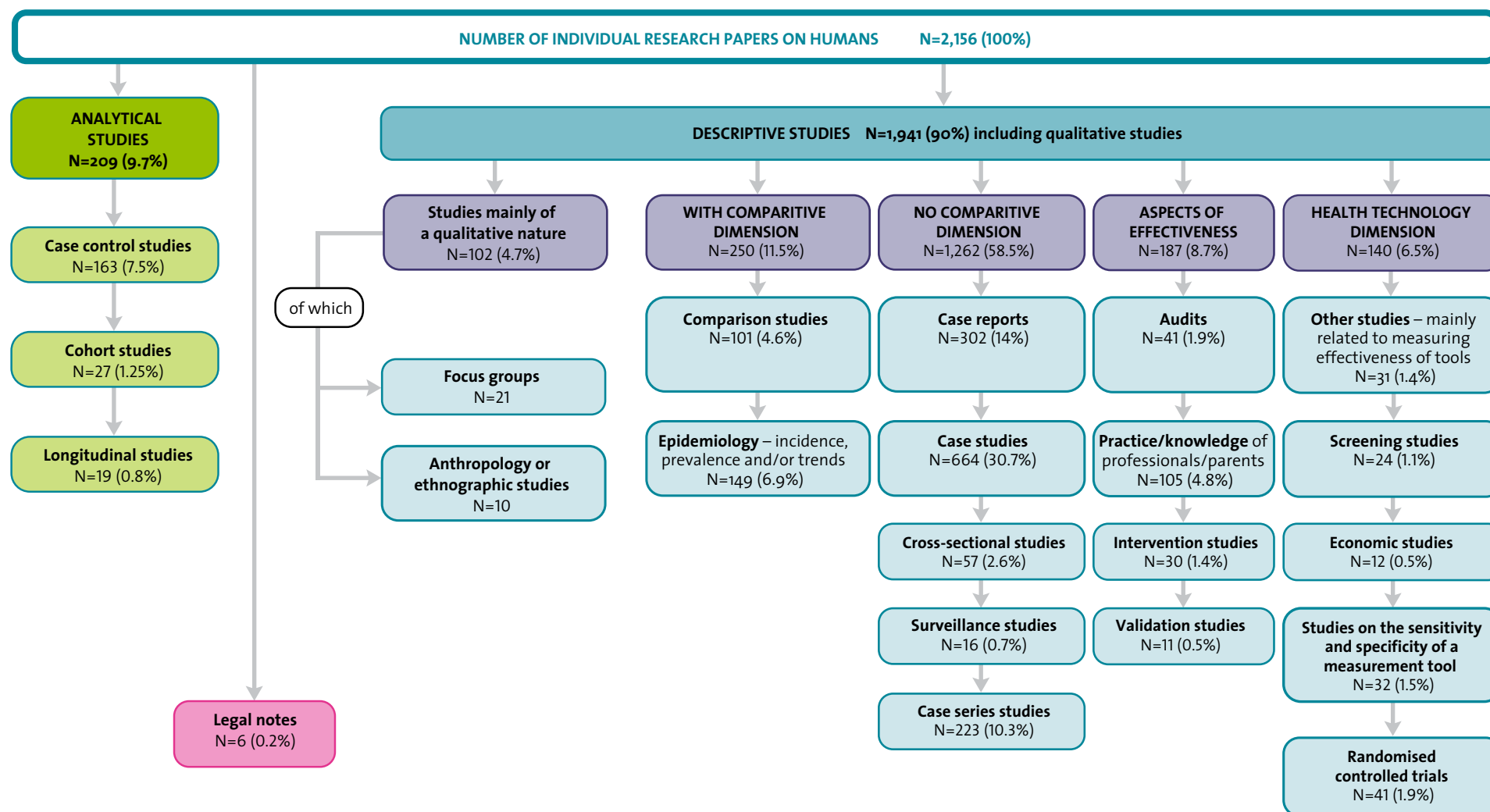


Figure 3: Grouping of published peer-reviewed individual research papers, by methodology and study type



Analytical studies

The 209 analytical studies (9.7%) consisted of 163 case control studies (7.5%) and 46 cohort studies (2.1%), with 19 of the cohort studies examining data of a longitudinal nature.

Among the 163 **case control studies**, 121 (5.6%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 41 (1.9%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (4); immunology (5); psychology (1); sociology (6); drugs (3); breastfeeding (2); deaths (1); disabilities (1); health services (3); medical procedures (1); organ transplants (2); syndromes (3); prematurity (2); anatomy (4); biological markers (2); and Other (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 8 and 9**.

Among the 46 **cohort and longitudinal studies**, 10 (0.5%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 36 (1.7%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: psychology (6); sociology (2); drugs (1); breastfeeding (2); deaths (1); health services (2); organ transplants (1); prematurity (3); anatomy (1); growth and development (2); diet and lifestyle (2); physical activity (2); education (2); biological markers (2); and Other (7). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 10-12**.

Table 8: Case control studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [4] <ul style="list-style-type: none"> □ Other bacterial diseases – meningococcal disease (2) □ Viral hepatitis – hepatitis C (1) □ Viral infections characterised by skin and mucous membrane lesions – measles (1)
C00-D48	Neoplasms [2] <ul style="list-style-type: none"> □ Neoplasms – lymphoblastic leukemia (2)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [1] <ul style="list-style-type: none"> □ Other diseases of blood and blood-forming organs – neutropenia (1)
E00-E90	Endocrine, nutritional and metabolic diseases [10] <ul style="list-style-type: none"> □ Diabetes mellitus – type 1 diabetes mellitus (2) □ Metabolic disorders – cystic fibrosis (3) □ Metabolic disorders – homocystinuria (1) □ Metabolic disorders – phenylketonuria (1) □ Other – diabetic nephropathy (2), diabetic ocular changes (1)
F00-F99	Mental and behavioural disorders [15] <ul style="list-style-type: none"> □ Behavioural and emotional disorders with onset usually occurring in childhood and adolescence – attention deficit hyperactivity disorder (9) □ Mental retardation – intellectual disabilities (2) □ Schizophrenia, schizotypal and delusional disorders – schizophrenia (3) □ Other – psychosis (1)
G00-G99	Diseases of the nervous system [2] <ul style="list-style-type: none"> □ Cerebral palsy and other paralytic syndromes – spastic hemiplegia (1) □ Polyneuropathies and other disorders of the peripheral nervous system – Charcot-Marie-Tooth Disease (1)
H00-H59	Diseases of the eye and adnexa [1] <ul style="list-style-type: none"> □ Disorders of choroid and retina – retinopathy of prematurity (1)
I00-I99	Diseases of the circulatory system [1] <ul style="list-style-type: none"> □ Diseases of arteries, arterioles and capillaries – spider naevi (1)
J00-J99	Diseases of the respiratory system [4] <ul style="list-style-type: none"> □ Chronic lower respiratory diseases – asthma (3) □ Other – respiratory disease (1)

Table 8: Case control studies – ICD-10 (continued)

BLOCK	TITLE
K00-K93	Diseases of the digestive system [5] <ul style="list-style-type: none"> ❑ Diseases of appendix – appendixes (2) ❑ Non-infective enteritis and colitis – ulcerative colitis (2) ❑ Other diseases of intestines – intestinal obstruction (1)
L00-L99	Diseases of the skin and subcutaneous tissue [2] <ul style="list-style-type: none"> ❑ Dermatitis and eczema – eczema (1) ❑ Papulosquamous disorders – psoriasis (1)
M00-M99	Diseases of the musculoskeletal system and connective tissue [5] <ul style="list-style-type: none"> ❑ Arthropathies – arthritis (1) ❑ Osteopathies and chondropathies – Perthes' Disease (2) ❑ Papulosquamous disorders – psoriatic arthritis (1) ❑ Systemic connective tissue disorders – dermatomyositis (1)
N00-N99	Diseases of the genitourinary system [15] <ul style="list-style-type: none"> ❑ Diseases of the genitourinary system – reflux nephropathy (11) ❑ Renal tubulo-interstitial diseases – vesicoureteric reflux (4)
O00-O99	Pregnancy, childbirth and the puerperium [9] <p>** Cephalopelvic disproportion (1), coagulation activation associated with pre-eclamptic pregnancy and with over-spills into the foetal circulation affecting the foetal haemostatic system (1), labour (1), macrosomic infant (1), neonatal encephalopathy (1), quantification of the relationship between precise angle of episiotomy from the perineal midline and risk of third-degree tear (1), tests the hypothesis that exposure to antenatal risk factors for sepsis alters the perinatal neutrophil phenotype (1), examines effects of maternal diabetes on foetal iron status (1), anal sphincter function (1)</p>
P00-P96	Certain conditions originating in the perinatal period [2] <ul style="list-style-type: none"> ❑ Other – brachial plexus paralysis (1), neonatal polycythaemia (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [38] <ul style="list-style-type: none"> ❑ Chromosomal abnormalities, not elsewhere classified – Down's Syndrome (2) ❑ Cleft lip and cleft palate – Cleft lip and/or palate (2) ❑ Congenital malformations and deformations of the musculoskeletal system – congenital diaphragmatic hernia (4) ❑ Other congenital malformations of the digestive system – congenital hypertrophic pyloric stenosis (5) ❑ Other – congenital anomaly (1) ❑ Congenital malformations of the circulatory system – patent ductus arteriosus (2) ❑ Congenital malformations of the urinary system – dysplastic kidney (2) ❑ Neural tube defects – condition (7) ❑ Other congenital malformations of the digestive system – Hirschsprung's Disease (13)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [5] <ul style="list-style-type: none"> ❑ Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (5)

Table 9: Case control studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Haemophilus influenzae (1), Helicobacter pylori (1), adenovirus and rotavirus (1), Epstein-Barr virus (1)
(2) IMMUNOLOGY	Neutrophil migration (1), neutrophil responses (1), neutrophils and bacterial infection (1), responses and infection (1), thymic emigrants (1)
(4) PSYCHOLOGY	Bullying (1)
(5) SOCIOLOGY	Sexual abuse – demographic characteristics (1), psychological and psychosocial characteristics (1) Programmes – Parenting Plus Programme (1), Stay Safe Programme (2), teenage mothers (1)

Table 9: Case control studies – themed, non-classifiable, health-related outcomes (continued)

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(6) DRUGS	Illicit drugs dependence (1), licit and illicit drugs exposure (1), licit drugs – parental penicillin (1)
(7) BREASTFEEDING	Breastfeeding +/- formulae milk (2)
(8) DEATHS	Deaths – infants (1)
(9) DISABILITIES	Disabilities – developmental (1)
(10) HEALTH SERVICES	Health service provision (2), vaccination (1)
(11) MEDICAL PROCEDURES	Ureteropelvic junction obstruction (1)
(12) ORGAN TRANSPLANTS	Antithymocyte globulin as induction immunotherapy (1), kidney (1)
(13) SYNDROMES	Intestinal hypoperistalsis (1), megacystis microcolon intestinal hypoperistalsis (1), megacystis-microcolon-intestinal peristalsis (1)
(14) PREMATUREITY	Births (1), children (1)
(15) ANATOMY	Brodmann's area (1), myenteric plexus (1), inflammatory bowel disease – non-specific (1), renal dysplasia – non-specific (1)
(21) BIOLOGICAL MARKERS	Transcription factors – nuclear factor of activated T cell 1 expression (1), pouchitis – condition (1)
(23) OTHER	Barriers to prenatal care (1)

Table 10: Cohort studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [5] <input type="checkbox"/> Human immunodeficiency virus disease – HIV (5)
C00-D48	Neoplasms [2] <input type="checkbox"/> Cancer (generic) (1) <input type="checkbox"/> Malignant neoplasms – lymphoblastic leukaemia (1)
F00-F99	Mental and behavioural disorders [1] <input type="checkbox"/> Psychiatry (1)
O00-O99	Pregnancy, childbirth and the puerperium [1] <input type="checkbox"/> Pregnancy, childbirth and the puerperium – perinatal death in twin pregnancies (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [1] <input type="checkbox"/> Chromosomal abnormalities, not elsewhere classified – Down's Syndrome (1)

Table 11: Cohort studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Mother-infant attachment (1), temporal orientation (present/future) concept (1)
(5) SOCIOLOGY	Sexual abuse – patterns in disclosure, investigation and outcomes (1)
(7) BREASTFEEDING	Infant feeding (1)
(8) DEATHS	Deaths (1)
(10) HEALTH SERVICES	Vaccination (1)
(12) ORGAN TRANSPLANTS	Cadaveric (1)
(14) PREMATUREITY	Births (2), children (1)
(15) ANATOMY	Corneal thickness (1)
(16) GROWTH AND DEVELOPMENT	Growth and development – motor development (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (1)
(19) EDUCATION	Education (2)
(21) BIOLOGICAL MARKERS	Iron status (1), taste (1)

Table 12: Longitudinal studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Self-competence and self-esteem (1), self-perceptions (1), childhood trauma and self-reported experiences of hallucinations (1), stressfulness of negative familial, academic and social events (1)
(5) SOCIOLOGY	Stability of childhood (1)
(6) DRUGS	Illicit drugs cocaine (1)
(7) BREASTFEEDING	Breastfeeding and weight gain (1)
(10) HEALTH SERVICES	Health service provision – primary care utilisation rates (1)
(16) GROWTH AND DEVELOPMENT	Developmental pathways of adolescents (1)
(17) DIET AND LIFESTYLE	Energy and nutrient intake (1)
(18) PHYSICAL ACTIVITY	Physical activity (1), aerobic fitness and birth weight (1)
(23) OTHER	Classification of overweight (1), psychotic disorders (1), maternal characteristics, particularly body mass index and infant birth weight (1), maternal dietary patterns and childhood asthma (1), cardiovascular disease or coronary heart disease (3)

Descriptive studies

The 1,941 descriptive studies (90%) consisted of 250 studies (11.5%) that included a comparative dimension of time, geography, procedure or treatment; 1,262 studies (58.5%) without a comparative dimension; 187 studies (8.7%) that measured aspects of effectiveness; and 140 studies (6.5%) with a health technology dimension. The remaining 102 descriptive studies (4.7%) were of a qualitative nature and included 21 studies that predominantly employed a focus group methodology and 10 that were anthropological or ethnographic in nature.

Descriptive studies with a comparative dimension

Of the 250 descriptive studies with a comparative dimension, there were 101 comparison studies (4.6%) and 149 epidemiological studies (6.9%) reporting statistical measures of incidence, prevalence and/or trends.

Among the 101 **comparison studies**, 40 (1.9%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 61 (2.8%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (4); psychology (7); sociology (10); drugs (2); breastfeeding (2); deaths (3); disabilities (1); health services (5); medical procedures (6); organ transplants (2); prematurity (1); growth and development (4); diet and lifestyle (1); education (1); dental (6); biological markers (1); and Other (5). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 13 and 14**.

Among the 149 **epidemiology studies**, 89 (4.1%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 60 (2.8%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (19); psychology (1); drugs (2); deaths (4); disabilities (3); health services (3); medical procedures (1); syndromes (4); prematurity (1); growth and development (3); diet and lifestyle (4); education (1); dental (5); biological markers (5); and Other (4). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 15 and 16**.

Table 13: Comparison studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [4] <ul style="list-style-type: none"> ☐ Human immunodeficiency virus [HIV] disease – HIV (1) ☐ Intestinal infectious diseases – gastroenteritis (1) ☐ Other bacterial diseases – meningococcal disease (1) ☐ Viral infections characterised by skin and mucous membrane lesions – varicella (1)
E00-E90	Endocrine, nutritional and metabolic diseases [4] <ul style="list-style-type: none"> ☐ Obesity and other hyperalimentation – obesity (4)
F00-F99	Mental and behavioural disorders [2] <ul style="list-style-type: none"> ☐ Mental retardation – intellectual abilities (1) ☐ Mental retardation – intellectual disabilities (1)
G00-G99	Diseases of the nervous system [2] <ul style="list-style-type: none"> ☐ Cerebral palsy and other paralytic syndromes – cerebral palsy (2)
H00-H59	Diseases of the eye and adnexa [1] <ul style="list-style-type: none"> ☐ Disorders of choroid and retina – retinopathy of prematurity (1)
I00-I99	Diseases of the circulatory system [1] <ul style="list-style-type: none"> ☐ Other forms of heart disease – left ventricular dysfunction (1)
J00-J99	Diseases of the respiratory system [2] <ul style="list-style-type: none"> ☐ Chronic lower respiratory diseases – asthma (1) ☐ Other – respiratory symptoms (1)
K00-K93	Diseases of the digestive system [3] <ul style="list-style-type: none"> ☐ Diseases of appendix (2) ☐ Other diseases of intestines – intestinal ischaemia-reperfusion injury (1)
M00-M99	Diseases of the musculoskeletal system and connective tissue [2] <ul style="list-style-type: none"> ☐ Arthropathies – arthritis (1) ☐ Dorsopathies – scoliosis (1)
N00-N99	Diseases of the genitourinary system [1] <ul style="list-style-type: none"> ☐ Renal tubulo-interstitial diseases – vesicoureteric reflux (1)
O00-O99	Pregnancy, childbirth and the puerperium [4] <ul style="list-style-type: none"> ☐ Pregnancy, childbirth and the puerperium (4)
P00-P96	Certain conditions originating in the perinatal period [5] <ul style="list-style-type: none"> ☐ Other congenital malformations of the digestive system – biliary atresia (2) ☐ Cleft lip and cleft palate – cleft lip and/or palate (1) ☐ Congenital malformations of the circulatory system – patent ductus arteriosus (1) ☐ Congenital malformations of the nervous system – spina bifida (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [9] <ul style="list-style-type: none"> ☐ Fractures (2) ☐ Injury (6) ☐ Unintentional injury (1)



Table 14: Comparison studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Campylobacter jejuni with Campylobacter upsaliensis with Haemophilus influenzae (1), Campylobacter upsaliensis (1), Haemophilus influenzae (1), rotavirus (1)
(4) PSYCHOLOGY	Moral reasoning (1), problematic behaviours (1), family support group (1), Parents Plus Programme (1), field-independence and problem solving (1), self-esteem (1), self-perceptions (1)
(5) SOCIOLOGY	Adolescent concern with social issues (1), homelessness (1), fathers' and mothers' participation in childcare/household (1), sexual abuse: child sex offenders' profiles (1), sexual abuse: demographic characteristics (1), sexual abuse: perceptions of paedophiles (1), war, violence and conflict (4)
(6) DRUGS	Alcohol (1), surfactant administration (1)
(7) BREASTFEEDING	Breastfeeding +/- formulae milk (2)
(8) DEATHS	Deaths – by location of birth (1), economic inequality (1), neonatal (1)
(9) DISABILITIES	Disability-free life expectancy (1)
(10) HEALTH SERVICES	Health services (4), vaccination (1)
(11) MEDICAL PROCEDURES	Maxillary expansion (1), maxillofacial operations (1), neonatal ventilation (1), otorhinolaryngology (1), Snodgrass hypospadias (1), tonsillectomy (1)
(12) ORGAN TRANSPLANTS	Renal (1), bone marrow (1)
(14) PREMATURETY	Infants (1)
(16) GROWTH AND DEVELOPMENT	Height and weight (1), neurodevelopmental and respiratory outcomes (1), social disadvantage on motor development (2)
(17) DIET AND LIFESTYLE	Diet and lifestyle (1)
(19) EDUCATION	Education (1)
(20) DENTAL	Dental (6)
(21) BIOLOGICAL MARKERS	Vitamin D (1)
(23) OTHER	Outcomes at A&E (1), clinical condition of newborn (1), clinical monitoring in the post-discharge period (1), historical representation (1), neonatal seizures (1)

Table 15: Epidemiology studies of incidence, prevalence and/or trends – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [15] <ul style="list-style-type: none"> <input type="checkbox"/> Diarrhoea (1) <input type="checkbox"/> Helminthiases – toxocaral eye disease (1) <input type="checkbox"/> Human immunodeficiency virus disease (2) <input type="checkbox"/> Other bacterial diseases – meningococcal disease (2) <input type="checkbox"/> Tuberculosis – tuberculosis (1) <input type="checkbox"/> Viral hepatitis – hepatitis B (1), hepatitis C (3) <input type="checkbox"/> Viral infections characterised by skin and mucous membrane lesions – herpes labialis (1), varicella (1) <input type="checkbox"/> Other viral diseases – mumps (2)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [1] <ul style="list-style-type: none"> <input type="checkbox"/> Haemolytic anaemias – sickle-cell disease (1)
E00-E90	Endocrine, nutritional and metabolic diseases [12] <ul style="list-style-type: none"> <input type="checkbox"/> Other disorders of glucose regulation and pancreatic internal secretion – hypoglycaemia (1) <input type="checkbox"/> Obesity and other hyperalimentation – obesity (3) <input type="checkbox"/> Diabetes mellitus – type 1 diabetes mellitus (5), type 2 diabetes mellitus (1) <input type="checkbox"/> Metabolic disorders – cystic fibrosis (2)
F00-F99	Mental and behavioural disorders [5] <ul style="list-style-type: none"> <input type="checkbox"/> Behavioural and emotional disorders with onset usually occurring in childhood and adolescence – attention deficit hyperactivity disorder (1), anorexia nervosa (1), eating disorders (1) <input type="checkbox"/> Other – mental health (1), mental health status (1)

Table 15: Epidemiology studies of incidence, prevalence and/or trends – ICD-10 (*continued*)

BLOCK	TITLE
G00-G99	Diseases of the nervous system [11] <ul style="list-style-type: none"> □ Cerebral palsy and other paralytic syndromes – cerebral palsy (5) □ Demyelinating diseases of the central nervous system – multiple sclerosis (3) □ Inflammatory diseases of the central nervous system – meningitis (1) □ Other disorders of the nervous system – idiopathic intracranial hypertension (1) □ Systemic atrophies primarily affecting the central nervous system – spastic paraparesis (1)
H00-H59	Diseases of the eye and adnexa [2] <ul style="list-style-type: none"> □ Disorders of vitreous body and globe – endophthalmitis (1) □ Other – visual disorders (1)
I00-I99	Diseases of the circulatory system [4] <ul style="list-style-type: none"> □ Cerebrovascular diseases – subdural haematoma (1) □ Diseases of arteries, arterioles and capillaries – abdominal aortic aneurysm (1) □ Other forms of heart disease – sudden cardiac death (2)
J00-J99	Diseases of the respiratory system [5] <ul style="list-style-type: none"> □ Chronic lower respiratory diseases – asthma (3) □ Other acute lower respiratory infections – bronchitis (1) □ Other diseases of upper respiratory tract – peritonsillar abscess disease (1)
K00-K93	Diseases of the digestive system [2] <ul style="list-style-type: none"> □ Disorders of gall bladder, biliary tract and pancreas – pancreatitis (1) □ Other – acute gastroenteritis (1)
L00-L99	Diseases of the skin and subcutaneous tissue [1] <ul style="list-style-type: none"> □ Other disorders of the skin and subcutaneous tissue – systemic lupus erythematosus (1)
M00-M99	Diseases of the musculoskeletal system and connective tissue [1] <ul style="list-style-type: none"> □ Osteopathies and chondropathies – Perthes' Disease (1)
O00-O99	Pregnancy, childbirth and the puerperium [3] <ul style="list-style-type: none"> □ Pregnancy, childbirth and the puerperium (3)
P00-P96	Certain conditions originating in the perinatal period [2] <ul style="list-style-type: none"> □ Haemorrhagic and haematological disorders of foetus and newborn – neonatal alloimmune thrombocytopenia (1) □ Other viral diseases – cytomegalovirus (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [9] <ul style="list-style-type: none"> □ Congenital malformations and deformations of the musculoskeletal system – developmental dysplasia of the hip (1) □ Chromosomal abnormalities, not elsewhere classified – Down's Syndrome (1) □ Cleft lip and cleft palate – cleft lip and/or palate (2) □ Other congenital malformations – neurofibromatosis type 1 (1) □ Other – congenital abdominal wall defects (1), hypospadias (1), neural tube defects – condition (2)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [3] <ul style="list-style-type: none"> □ Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (1) □ Abnormal findings on examination of blood, without diagnosis – hereditary hemochromatosis (1) □ Symptoms and signs involving the digestive system and abdomen – hyperbilirubinaemia (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [9] <ul style="list-style-type: none"> □ Femoral fractures (1), fractures (1), injury (5), poisoning (2)
V01-Y98	External causes of morbidity and mortality [4] <ul style="list-style-type: none"> □ Intentional self-harm – self-injury (1), suicide (3)

Table 16: Epidemiology studies of incidence, prevalence and/or trends – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Coxiella burnetii (1), enterobacteriaceae (1), enterococci and streptococci (1), Escherichia coli O157 (1), Group B Strep (1), Haemophilus influenzae (2), Helicobacter pylori (2), invasive pneumococcal (1), pneumococcal disease (1), Pseudomonas aeruginosa (1), staphylococci (1), Staphylococcus aureus (1), Streptococcus pneumoniae (1), methicillin-resistant Staphylococcus aureus (1), adenovirus (1), rotavirus (1), fungi (1)
(4) PSYCHOLOGY	Bullying (1)
(6) DRUGS	Cannabis (1), smoking (1)
(8) DEATHS	Cause-specific (1), homicides (1), infants (1), intrapartum foetal death (1)
(9) DISABILITIES	Disabilities (1), child blindness (1), congenital brachial palsy (1)
(10) HEALTH SERVICES	Health service provision (2), vaccinations (1)
(11) MEDICAL PROCEDURES	Tonsillectomy (1)
(13) SYNDROMES	Auto-immune polyendocrinopathy-candidiasis-ectodermal dystrophy (1), cyclic vomiting syndrome (1), hemolytic uremic (1), Kabuki (1)
(14) PREMATUREITY	Premature infants (1)
(16) GROWTH AND DEVELOPMENT	Height and weight (2), primary reflexes (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (4)
(19) EDUCATION	Education (1)
(20) DENTAL	Dental (5)
(21) BIOLOGICAL MARKERS	Vitamin D (1), Vitamin K (1), blood pressure (1), heart muscle disease-induced heart failure (1), inflammatory bowel disease – non-specific (1)
(23) OTHER	Chimeric transcripts (1), malignancy (1), toxoplasma infection (2)

Descriptive studies without a comparative dimension

Descriptive studies without a comparative dimension consisted of 302 case reports (14%), 664 case studies (30.7%), 57 cross-sectional studies (2.6%), 16 surveillance studies (0.7%) and 223 case series studies (10.3%).

The 302 **case reports** differed substantively in nature from all other studies in that they reported on the characteristics of one person or one family group and are of interest because they represent unusual observations or phenomena. However, these observations should not be considered representative of the general population. Of the 302 studies, 192 reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 110 examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (3); neurology (3); psychology (2); sociology (1); health services (11); medical procedures (3); organ transplants (2); syndromes (45); dental (6); legal issues (13); and Other (19). In addition, there were 2 cases classified to ICO. Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 17-19**.

Among the 664 **case studies**, 266 (12.3%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 398 (18.4%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (37); immunology (4); psychology (37); sociology (34); drugs (17); breastfeeding (6); deaths (6); disabilities (11); health services (40); medical procedures (21); organ transplants (4); syndromes (6); prematurity (7); anatomy (4); growth and development (10); diet and lifestyle (8); physical activity (9); education (22); dental (23); biological markers (28); legal issues (28); and Other (36). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 20 and 21**.

Among the 57 **cross-sectional studies**, 18 (0.8%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 39 (2%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: psychology (6); sociology (3); breastfeeding (1); health services (3); medical procedures (1); growth and development (1); diet and lifestyle (10); physical activity (5); education (2); dental (3); biological markers (2); legal issues (1); and Other (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 22 and 23**.

Among the 16 **surveillance studies**, 9 (0.4%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 7 (0.3%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (3); health services (3); and Other (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 24 and 25**.

Among the 223 **case series studies**, 118 (5.5%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 105 (4.8%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (1); drugs (1); deaths (1); health services (2); medical procedures (48); organ transplants (14); syndromes (10); prematurity (1); and biological markers (26). In addition, there was one case classified to ICO-O-3. Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 26-28**.

Table 17: Case reports – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [8]
C00-D48	Neoplasms [10]
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [5]
E00-E90	Endocrine, nutritional and metabolic diseases [16]
F00-F99	Mental and behavioural disorders [18]
G00-G99	Diseases of the nervous system [9]
H00-H59	Diseases of the eye and adnexa [6]
H60-H95	Diseases of the ear and mastoid process [3]
I00-I99	Diseases of the circulatory system [20]
J00-J99	Diseases of the respiratory system [6]
K00-K93	Diseases of the digestive system [14]
L00-L99	Diseases of the skin and subcutaneous tissue [8]
M00-M99	Diseases of the musculoskeletal system and connective tissue [19]
N00-N99	Diseases of the genitourinary system [4]
O00-O99	Pregnancy, childbirth and the puerperium [1]
P00-P96	Certain conditions originating in the perinatal period [11]
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [25]
S00-T98	Injury, poisoning and certain other consequences of external causes [7]
V01-Y98	External causes of morbidity and mortality [2]

Table 18: Case reports – ICO-O-3

ICD-O: 9540/3	Penile malignant peripheral nerve sheath tumour Neurofibrosarcoma (1)
ICD-O: 8800-9059	Connective/soft tissue tumours and sarcomas (1)

Table 19: Case reports – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Mycobacterium virus (1), parvovirus B19 infection (2)
(3) NEUROLOGY	Neurological (3)
(4) PSYCHOLOGY	Psychosocial functioning (2)
(5) SOCIOLOGY	Community – segregation and conflict (1)
(10) HEALTH SERVICES	Health service provision (11)
(11) MEDICAL PROCEDURES	Chest wall reconstruction (1), post-dural puncture headache (1), surgical repair – arterial anastomoses (1)
(12) ORGAN TRANSPLANTS	Allogeneic hematopoietic stem cell transplantation (1), liver (1)
(13) SYNDROMES	Gianotti-Crosti (1), IPEX (1), acute respiratory distress (1), Antley-Bixler (1), Asperger's (1), carbonic anhydrase II deficiency (1), central hypoventilation (1), Cohen (1), cold auto-inflammatory (1), de Lange (1), femoral hypoplasia – unusual facies (1), foetal carbimazole (1), Fraser (1), Freeman-Sheldon (1), Frey's (1), genitopatellar (1), hypoplastic left heart (1), Jacobsen (1), Job (1), Kabuki (3), Kallmann (1), Katargener's (1), Kawasaki (2), Keipert (1), Kenny-Caffey (1), Knobloch (1), Malpuech (2), Moya Moya (1), neonatal abstinence (1), oculo-facio-cardio-dental (1), Parry-Romberg (1), Prader-Wili (1), Rothmund-Thomson (1), Turner's (1), Walker-Warburg (1), VATER Syndrome vertebrae, anus, trachea, oesophagus, and renal (1), Other (5)
(20) DENTAL	Dental (6)
(22) LEGAL ISSUES	Legal or care issues (13)
(23) OTHER	Carbonic anhydrase II deficiency-condition (1), complex IV respiratory chain deficiency (1), diagnostically challenging case (1), enterocolic venopathy (1), gastric stromal tumours (1), growth and development – craniosynostosis (1), hyperandrogenism (1), iatrogenic event (1), kidney disease (1), latex allergy (1), lipomyelocele (1), long chain fatty acid oxidation defects (1), microgastria (1), microtia (1), nasal chondromesenchymal hamartoma (1), nephrocalcinosis (1), raised acute phase reactants (1), rhombencephalosynapsis (1), severe factor X deficiency (1)

Table 20: Case studies – ICD-10

BLOCK	TITLE
B20-B24 A00-B99	Certain infectious and parasitic diseases [24] <ul style="list-style-type: none"> <input type="checkbox"/> Human immunodeficiency virus [HIV] disease (9) <input type="checkbox"/> Intestinal infectious diseases – cryptosporidiosis (2) <input type="checkbox"/> Viral hepatitis – hepatitis C (3) <input type="checkbox"/> Viral infections characterised by skin and mucous membrane lesions – measles (1) <input type="checkbox"/> Other bacterial diseases – meningococcal disease (1) <input type="checkbox"/> Helminthiasis – ocular toxocariasis (1) <input type="checkbox"/> Mycoses – onychomycosis (1), Tinea capitis (1) <input type="checkbox"/> Tuberculosis – tuberculosis (3) <input type="checkbox"/> Viral infections characterised by skin and mucous membrane lesions – varicella (2)
C00-D48	Neoplasms [9] <ul style="list-style-type: none"> <input type="checkbox"/> Malignant neoplasms – lymphoblastic leukemia (1), lymphoid malignancies (1), neuroblastoma (5), pheochromocytoma (1), thyroid medullary carcinoma (1)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [3] <ul style="list-style-type: none"> <input type="checkbox"/> Other diseases of blood and blood-forming organs – chronic granulomatous disease (1) <input type="checkbox"/> Haemolytic anaemias – haemolytic disease (1) <input type="checkbox"/> Coagulation defects, purpura and other haemorrhagic conditions – thrombocytopenia (1)
E00-E90	Endocrine, nutritional and metabolic diseases [20] <ul style="list-style-type: none"> <input type="checkbox"/> Obesity and other hyperalimentation – obesity (5) <input type="checkbox"/> Diabetes mellitus – type 1 diabetes mellitus (4) <input type="checkbox"/> Metabolic disorders – cystic fibrosis (8), glutaric aciduria type 1 (1), hyponatraemia (1) <input type="checkbox"/> Other – Familial Glucocorticoid Deficiency (1)

Table 20: Case studies – ICD-10 (*continued*)

BLOCK	TITLE
F00-F99	<p>Mental and behavioural disorders [48]</p> <ul style="list-style-type: none"> □ Behavioural and emotional disorders with onset usually occurring in childhood and adolescence – attention-deficit hyperactivity disorder (24) □ Disorders of psychological development – autism (8) □ Disorders of psychological development – dyslexia (2) □ Disorders of psychological development – learning disabilities (4) □ Mental retardation – intellectual disabilities (6) □ Mood [affective] disorders – bipolar affective disorder (1), depression (1) □ Other ill-defined mental health problems (1) □ Schizophrenia, schizotypal and delusional disorders – schizophrenia (1)
G00-G99	<p>Diseases of the nervous system [20]</p> <ul style="list-style-type: none"> □ Cerebral palsy and other paralytic syndromes – cerebral palsy (13), spastic paraplegia (1) □ Episodic and paroxysmal disorders – epilepsy (2), obstructive sleep apnea (1) □ Extrapyramidal and movement disorders – dystonia-Parkinsonism (1) □ Inflammatory diseases of the central nervous system – meningitis (1) □ Systemic atrophies primarily affecting the central nervous system – Friedreich's Ataxia (1)
H00-H59	<p>Diseases of the eye and adnexa [5]</p> <ul style="list-style-type: none"> □ Disorders of ocular muscles, binocular movement, accommodation and refraction – myopia (1) □ Disorders of choroid and retina – diabetic retinopathy (1), retinopathy of prematurity (2) □ Disorders of sclera, cornea, iris and ciliary body – uveitis (1)
H60-H95	<p>Diseases of the ear and mastoid process [2]</p> <ul style="list-style-type: none"> □ Other disorders of ear – deafness (2)
I00-I99	<p>Diseases of the circulatory system [2]</p> <ul style="list-style-type: none"> □ Ischaemic heart disease (2)
J00-J99	<p>Diseases of the respiratory system [15]</p> <ul style="list-style-type: none"> □ Chronic lower respiratory diseases – asthma (7), chronic lung disease (1) □ Influenza and pneumonia – influenza (1) □ Lower respiratory pathogens (1) □ Other acute lower respiratory infections – bronchiolitis (1) □ Pneumonitis (1) □ Other – respiratory/tract (3)
K00-K93	<p>Diseases of the digestive system [4]</p> <ul style="list-style-type: none"> ** Appendectomy (1) □ Non-infective enteritis and colitis – Crohn's Disease (1) □ Other diseases of the digestive system – Coeliac Disease (2)
L00-L99	<p>Diseases of the skin and subcutaneous tissue [3]</p> <ul style="list-style-type: none"> □ Dermatitis and eczema – atopic dermatitis (1), eczema (2)
M00-M99	<p>Diseases of the musculoskeletal system and connective tissue [11]</p> <ul style="list-style-type: none"> □ Dorsopathies – scoliosis (6) □ Osteopathies and chondropathies – avascular necrosis (1), Caffey's Disease (1), Perthes' Disease (1), dermatomyositis (2)
N00-N99	<p>Diseases of the genitourinary system [8]</p> <ul style="list-style-type: none"> □ Other diseases of urinary system – upper urinary tract (1) □ Renal tubulo-interstitial diseases – vesicoureteric reflux (4) □ Glomerular diseases – type 2 membranoproliferative glomerulonephritis (1), membranoproliferative glomerulonephritis type III (1) □ Other – renal failure (1)
O00-O99	<p>Pregnancy, childbirth and the puerperium [25]</p> <ul style="list-style-type: none"> ** Chorioamnionitis (2), active management of labour (1), birth weight (1), breastfeeding (2), caesarean section (4), delivery outcomes (1), diabetes and pregnancies (1), elective induction for post-term pregnancy (1), foetal cortisol and labour (1), foetal macrosomia and non-diabetic women (1), hydramnios (1), immigrant women (2), labour and epidural analgesia effects on plasma alpha1-acid glycoprotein concentration (1), maternal antenatal emotional attachment (1), pelvic floor musculature (1), perinatal factors and pre-term delivery (1), postnatal care (1), seasonal variation in birth weight (1), twin-to-twin transfusion syndrome (1)

Table 20: Case studies – ICD-10 (*continued*)

BLOCK	TITLE
P00-P96	Certain conditions originating in the perinatal period [2] <ul style="list-style-type: none"> □ Haemorrhagic and haematological disorders of foetus and newborn – Haemolytic Disease (1), Rhesus D Hydrops foetalis (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [33] <ul style="list-style-type: none"> □ Other viral diseases – congenital cytomegalovirus (2) □ Other – congenital anomaly (1), congenital velopharyngeal insufficiency (1), other congenital malformations – Kabuki Syndrome (1), congenital malformations (1), congenital vertebral anomaly (2), clubfoot (1), heart disease (1), neural tube defect – condition (3) □ Cleft lip and/or palate (3) □ Chromosomal abnormalities, not elsewhere classified – Down’s Syndrome (6) □ Congenital malformations and deformations of the musculoskeletal system – dysplasia of the hip (1), exomphalos (1) □ Other congenital malformations of the digestive system – Hirschsprung’s Disease (1), hypertrophic pyloric stenosis (2) □ Congenital malformations of the circulatory system – patent ductus arteriosus (1), perimembranous ventricular septal defect (1), pulmonary atresia (2), spina bifida (2)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [6] <ul style="list-style-type: none"> □ Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (4) □ Symptoms and signs involving the circulatory and respiratory systems – epistaxis (2)
S00-T98	Injury, poisoning and certain other consequences of external causes [22] <ul style="list-style-type: none"> □ Injury (21), poisoning (1)
V01-Y98	External causes of morbidity and mortality [4] <ul style="list-style-type: none"> □ Intentional self-harm – deliberate self-harm (1), suicidal ideation/behaviour (1), suicide (2)

Table 21: Case studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Bacterial monitoring (1), Burkholderia cepacia (1), Campylobacter upsaliensis (1), Chlamydia trachomatis (1), Enterobacter sakazakii (2), genus Bifidobacterium (1), Helicobacter pylori (3), Lactobacillus (1), Lactobacillus salivarius (1), Lactobacillus, Lactococcus, Pediococcus and Bifidobacterium (1), Mycoplasma pneumoniae (1), non-b Haemophilus influenzae disease (1), Staphylococcus aureus (1), Streptococcus (1), Streptococcus pneumoniae (2), Candida albicans (1), Candideamia (1), methicillin-resistant Staphylococcus aureus (3), vancomycin-resistant enterococci (2), vancomycin-resistant Enterococcus faecium (1), Escherichia coli serotype O26:H11 (2), BK polyomavirus (1), herpesvirus (1), norovirus (1), Norwalk-like viruses, astroviruses (1), rotavirus (4)
(2) IMMUNOLOGY	Interleukin-2 (1), neutrophils (1), primary immunodeficiency disorders (1), thymic emigrants (1)
(4) PSYCHOLOGY	Psychosocial effects of illness (1), psychotic effects of traumatic event (1), self-esteem (3), applied behaviour analysis (1), bullying (6), community-based youth counselling services (1), children’s understanding of illness and injury (1), concepts of well-being (1), aberrant behaviour (1), historical thinking (1), intergroup forgiveness (1), language (2), maternal well-being (1), parental – perceived parental expectation and criticism (1), parents’ perceptions of their interactions with their children (1), perspective-taking (1), positive attachment in early infancy (1), post-partum family experiences (1), psychological health (1), reasoning ability (1), reflection (1), religion (3), same-sex attraction (1), self-reported health (1), shock (1), sustained attention (1), theory of planned behaviour (1)

Table 21: Case studies – themed, non-classifiable, health-related outcomes (*continued*)

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(5) SOCIOLOGY	Assessment of vulnerable children (1), child-initiated play versus adult-directed activities (1), cross-border partnership (1), cross-community marriage (1), cross-cultural conditions (1), cross-cultural experiences (1), cross-cultural minority-majority group intermarriages (1), cross-national collaboration through information and communications technology (1), demographics of a Northern Irish town (1), domestic violence (1), elderly relatives' supervision of children (1), families: community needs (1), families: policy and practice (1), health and social functioning (1), homelessness (1), leaving State care (1), maternal employment characteristics (1), parental school involvement (1), political awareness (1), programme – Belfast Youth Development Study (1), programme – parent training programme on child conduct problems (1), racist (1), racist harassment (1), social disadvantage (1), socio-economic disadvantage (1), work/life balance (1), working in childhood (1), young people's heroes (1), war, violence and conflict (6)
(6) DRUGS	Abuse (1), cigarettes (1), cisaprid ranitidine (1), diclofenac extraction (1), investigating use (1), misuse profile (1), non-licensed use (1), problem use (1), self-injectable epinephrine dispensing (1), smoking and alcohol (1), specialised drug (1), therapy (1), tobacco (2), drugs, pharmacological treatment – adverse reactions (1), anti-depressants (1), delivery systems (1)
(7) BREASTFEEDING	Breastfeeding +/- formulae milk (6)
(8) DEATHS	Colorectal cancer (1), in one family (1), infanticide (1), lung cancer (1), neonatal (1), while exercising (1)
(9) DISABILITIES	Community nurses (1), diagnostic criteria (1), information needs of parent (1), multiple (1), non-specific (2), physical (1), physical or intellectual disabilities (1), reduced vision (1), vision accommodative responses (1), visual impairment (1)
(10) HEALTH SERVICES	Vaccination (5), health service provision (34), home support services (1)
(11) MEDICAL PROCEDURES	Aenotonsillectomy (1), amplatzer septal occluder (1), aortoplasty (1), cataract surgery (1), caudal epidural anaesthesia (1), cochlear implant (1), fluid-attenuated inversion recovery MRI sequence in providing better margin visualization (1), Ganz osteotomy (1), island flap reconstruction, congenital incomplete syndactyly (1), limb amputations (1), non-bronchoscopic bronchoalveolar lavage (1), ochidopexy (1), optic nerve sheath ultrasound (1), otorhinolaryngological (1), paediatric foreign bodies (1), paediatric surgery (1), renal replacement therapy (1), spinal fusion (1), submandibular duct relocation (1), EEG measures (1), whole-body MR (1)
(12) ORGAN TRANSPLANTS	Bone marrow (1), liver (1), renal (2)
(13) SYNDROMES	Beckwith-Wiedemann Syndrome (1), Coen (1), Turner (1), inflammatory response (1), Megacystis-microcolon-intestinal hypoperistalsis (1), Schinzel-Giedion (1)
(14) PREMATUREITY	Babies (1), children (2), infants (3), neonates (1)
(15) ANATOMY	Schoolchildren's posture (1), testicular sperm (1), the human gut (1), inflammatory bowel disease – non-specific (1)
(16) GROWTH AND DEVELOPMENT	Anthropometry – infant weight (1), growth and development – effect of baby walkers on the achievement of normal locomotory milestones (1), height, weight (1), infant physiological and movement responses (1), parental reporting of selected variables related to development (1), psychological data (1), algorithm to measure gait (1), gait in children with cerebral palsy (1), locomotor ability in children with cerebral palsy (1), gait using modelling software (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (8)
(18) PHYSICAL ACTIVITY	Physical activity (9)
(19) EDUCATION	Education (22), including papers on education and care (1), education and violence (1) and endangered language (1)
(20) DENTAL	Dental (23)

Table 21: Case studies – themed, non-classifiable, health-related outcomes (*continued*)

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(21) BIOLOGICAL MARKERS	Prion protein gene (1), apoptosis-programmed cell death (1), autologous dendritic cells (1), bile salt-stimulated lipase (1), bone cells (1), cardiac troponin I (1), Cobb angle (1), cord blood T-cell biology (1), folate and folic acid (2), gestational iron status (1), ilioinguinal/iliohypogastric nerve block (1), intervertebral disc (2), intestinal aganglionosis (1), intraocular pressure (1), maternal and cord leptin concentrations (1), mesangioproliferative glomerulonephritis (1), mesenteric cysts (1), mitochondrial cytopathies (1), natural-killer (NK) cell deficiency (1), oxidative stress marker (1), oxygen saturation in flights (1), paediatric brain at autopsy (1), severe recurrent abdominal pain (1), sigmoid sinus thrombosis (1), Vitamin D (1), Vitamin K (1)
(22) LEGAL ISSUES	Adoption (7), child abuse (2), child neglect (1), child protection (3), consent (1), legal or care issues (7), the Police Ombudsman (1), sexual abuse – assault (1), sexual abuse – demographic characteristics (1), sexual abuse – generic (1), sexual abuse – offenders (1), sexual abuse – perpetrators (1), sexual abuse – policy, practice and service delivery (1)
(23) OTHER	Aacrylamide (1), bone-anchored hearing aids (1), cardiopulmonary resuscitation instruction (1), chronic and/or life-threatening illness (1), chronic illness (1), constipation (1), exposure to food-packaging migrants (1), fertility (2), genome-wide linkage scan (1), health status measure (1), herbal medicine (1), homocysteine-lowering treatment (1), impaired vocal quality (1), isoflavone intake (1), life-threatening event (2), life-threatening illness (1), low systemic flow (1), mid-year population estimates (1), non-syndromic trigonocephaly patients (1), pain (2), parenteral nutrition-dependence (1), pollution (1), radon/radon levels (2), resolution acuity (1), respiratory health of children (1), rhombencephalitis (1), Salmonella bredeney (1), the Irish Roma gypsy population (1), neonatal seizures (4). (Also 1 abstract from a conference for which the actual paper was included in the mapping study.)

Table 22: Cross-sectional studies – ICD-10

BLOCK	TITLE
E00-E90	Endocrine, nutritional and metabolic diseases [4] <ul style="list-style-type: none"> <input type="checkbox"/> Obesity and other hyperalimentation – obesity (2) <input type="checkbox"/> Diabetes mellitus – diabetes mellitus (2)
F00-F99	Mental and behavioural disorders [2] <ul style="list-style-type: none"> <input type="checkbox"/> Disorders of psychological development – dyslexia (1) <input type="checkbox"/> Mood [affective] disorders – depression (1)
G00-G99	Diseases of the nervous system [2] <ul style="list-style-type: none"> <input type="checkbox"/> Cerebral palsy and other paralytic syndromes – cerebral palsy (2)
H00-H59	Diseases of the eye and adnexa [1] <ul style="list-style-type: none"> <input type="checkbox"/> Disorders of ocular muscles, binocular movement, accommodation and refraction – cycloplegia (1)
J00-J99	Diseases of the respiratory system [1] <ul style="list-style-type: none"> <input type="checkbox"/> Chronic lower respiratory diseases – asthma (1)
O00-O99	Pregnancy, childbirth and the puerperium [2] <ul style="list-style-type: none"> <input type="checkbox"/> Pregnancy, childbirth and the puerperium (2)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [2] <ul style="list-style-type: none"> <input type="checkbox"/> Chromosomal abnormalities, not elsewhere classified – Down's Syndrome (1), neural tube defects (1)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [1] <ul style="list-style-type: none"> <input type="checkbox"/> Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [2] <ul style="list-style-type: none"> <input type="checkbox"/> Injury (2)
V01-Y98	External causes of morbidity and mortality [1] <ul style="list-style-type: none"> <input type="checkbox"/> Intentional self-harm – suicidal (1)

Table 23: Cross-sectional studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Drugs – alcohol (1), bullying (2), supportive relationships (1), loneliness (1), self-reported health (1)
(5) SOCIOLOGY	War, violence and conflict (1), social status and social exclusion (1), vulnerable families (1)
(7) BREASTFEEDING	Breastfeeding +/- formulae milk (1)
(10) HEALTH SERVICES	Health service provision (1), vaccinations (2)
(11) MEDICAL PROCEDURES	Procedures (1)
(16) GROWTH AND DEVELOPMENT	Epiphyseal union (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (diet and skeletal growth) (10)
(18) PHYSICAL ACTIVITY	Physical activity (5)
(19) EDUCATION	Education (2)
(20) DENTAL	Dental (3)
(21) BIOLOGICAL MARKERS	Vitamin D (1), lateral preference (1)
(22) LEGAL ISSUES	Human rights (1)
(23) OTHER	Alternative medicines (1)

Table 24: Surveillance studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [4] <ul style="list-style-type: none"> ☐ Intestinal infectious diseases – cryptosporidiosis (1) ☐ Intestinal infectious diseases – salmonellosis (1) ☐ Other viral diseases – mumps (1) ☐ Protozoal diseases – malaria (1)
J00-J99	Diseases of the respiratory system [4] <ul style="list-style-type: none"> ☐ Influenza and pneumonia – influenza (4)
L00-L99	Diseases of the skin and subcutaneous tissue [1] <ul style="list-style-type: none"> ☐ Infections of the skin and subcutaneous tissue – staphylococcal scalded skin syndrome (1)

Table 25: Surveillance studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	E. coli (2), norovirus (1)
(10) HEALTH SERVICES	Vaccinations (3)
(23) OTHER	Surveillance – contaminated city water (1)



Table 26: Case series – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [4] <ul style="list-style-type: none"> □ Viral infections characterised by skin and mucous membrane lesions – plantar warts (1), measles (1) □ Human immunodeficiency virus [HIV] disease (1) □ Bacterial, viral and other infectious agents – respiratory syncytial virus infection (1)
C00-D48	Neoplasms [8] <ul style="list-style-type: none"> □ Malignant neoplasms – retinoblastoma (1), posterior fossa tumours (1), pheochromocytoma (1), leukemia (1), Hodgkin's lymphoma (2) □ Benign neoplasms – respiratory papillomatosis (1), haemangioma (1)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [3] <ul style="list-style-type: none"> □ Coagulation defects, purpura and other haemorrhagic conditions – haemophilia (3)
E00-E90	Endocrine, nutritional and metabolic diseases [4] <ul style="list-style-type: none"> □ Metabolic disorders – glutaric aciduria type 1 (2) □ Disorders of the thyroid gland (1) □ Adrenal disease (1)
G00-G99	Diseases of the nervous system [2] <ul style="list-style-type: none"> □ Nerve, nerve root and plexus disorders – non-traumatic brachial plexopathy (1) □ Cerebral palsy and other paralytic syndromes – cerebral palsy (1)
H00-H59	Diseases of the eye and adnexa [12] <ul style="list-style-type: none"> □ Disorders of ocular muscles, binocular movement, accommodation and refraction – esotropia (1), myopia (1) □ Visual disturbances and blindness – amblyopia (1) □ Glaucoma (1) □ Disorders of vitreous body and globe – endophthalmitis (1) □ Disorders of lens – paediatric aphakic glaucoma (1), ectopia lentis (1) □ Disorders of choroid and retina – diabetic retinopathy (1), retinopathy of prematurity (3), Coats' Disease (1)
H60-H95	Diseases of the ear and mastoid process [3] <ul style="list-style-type: none"> □ Diseases of middle ear and mastoid – otitis media (2), mastoiditis (1)
I00-I99	Diseases of the circulatory system [1] <ul style="list-style-type: none"> □ Ischaemic heart disease (1)
J00-J99	Diseases of the respiratory system [1] <ul style="list-style-type: none"> □ Acute upper respiratory infections – sinusitis (1)
K00-K93	Diseases of the digestive system [10] <ul style="list-style-type: none"> □ Other diseases of the digestive system – Coeliac Disease (1) □ Other diseases of intestines – intussusception (1) □ Non-infective enteritis and colitis – Crohn's Disease (1), ulcerative colitis (1) ** Appendixes (1), appendicoliths (2), appendectomy (2), anal sphincter achalasia (1)
N00-N99	Diseases of the genitourinary system [15] <ul style="list-style-type: none"> □ Renal tubulo-interstitial diseases – vesicoureteric reflux (12) □ Other disorders of kidney and ureter-ureterocele (1) □ Other diseases of urinary system – urinary tract infection (2)
O00-O99	Pregnancy, childbirth and the puerperium [5] <ul style="list-style-type: none"> □ Pregnancies with non-Rh-D antibody (1), pregnancies in diabetic women (1), outcome of pregnancies with singleton breech presentation at term (1), obstetric antecedents for pre-term delivery (1), cardiac function in pre-term infants (1)
P00-P96	Certain conditions originating in the perinatal period [1] <ul style="list-style-type: none"> □ Digestive system disorders of foetus and newborn – necrotising enterocolitis (1)

Table 26: Case series – ICD-10 (*continued*)

BLOCK	TITLE
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [23] <ul style="list-style-type: none"> ❑ Other congenital malformations of the digestive system – Symptomatic Meckel's diverticulum (1), oesophageal atresia (1), jejunal atresia (1), Hirschsprung's Disease (3), biliary atresia (1) ❑ Other congenital malformations – exomphalos major (1), epidermolysis bullosa (1) ❑ Congenital malformations of the nervous system – spina bifida (1) ❑ Congenital malformations of the circulatory system – congenital heart disease (1), atrioventricular septal defects (1), anomalous left coronary artery (1) ❑ Congenital malformations of genital organs – undescended testis (1), cryptorchid (1) ❑ Congenital malformations of eye, ear, face and neck – congenital nasolacrimal duct obstruction (1) ❑ Congenital malformations and deformations of the musculoskeletal system – scaphocephaly (1) ❑ Cleft lip and cleft palate – cleft lip and/or palate (1) ❑ Chromosomal abnormalities, not elsewhere classified – Down's Syndrome (1) ❑ Others – congenital vertebral anomaly (1), congenital cataract surgery (1), congenital and developmental cataract (1), congenital coagulation disorders (1)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [2] <ul style="list-style-type: none"> ❑ Symptoms and signs involving the circulatory and respiratory systems – epistaxis (1) ❑ General symptoms and signs – hyperhidrosis (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [24] <ul style="list-style-type: none"> ❑ Poisons (1), near drowning (1), injury (13), fracture (9)

Table 27: Case series – ICD-O-3

ICD-O: 9200/0	Osteoid osteoma [2]
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Table 28: Case series – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Bacterium – <i>Helicobacter pylori</i> (1)
(6) DRUGS	Drugs – analgesia (1)
(8) DEATHS	Death – serum albumin and mortality (1)
(10) HEALTH SERVICES	Hospital infection – in a neurosurgical unit (1), in a neonatal intensive care unit (1)
(11) MEDICAL PROCEDURES	Ablation for ingrown toenails (1), alveolar bone grafts (1), bilateral intraocular lens implants (1), bone grafting of alveolar cleft (1), cholecystectomy (2), cochlear implant (2), congenital diaphragmatic hernia repair (1), distal hypospadias repair (1), endoscopic correction and contralateral reflux (1), femoral epiphysis fixation (2), FEV ₁ (1), foreign bodies extraction (1), heminephrectomy (2), heminephrectomy (1), hydroxyapatite orbital implants (1), invasive surgery (1), lumbar interbody fusion (1), myelomeningocele (1), orchidopexy (1), pacing lead (1), paediatric mitral repair (1), penetrating keratoplasty (1), percutaneous transhepatic broviac insertion (1), perioperative antimicrobial therapy (1), preputioplasty (1), pulmonary function studies (1), radiotherapy on abdominopelvic tumours (1), sedation with oral chloral hydrate (1), septorhinoplasty (1), subscapularis muscle release (1), surgery for canal wall down mastoid (1), surgery for primary avulsion of posterior urethral valves (1), surgical repair of retinal dialysis (1), titanium elastic nails (1), tonsillectomy (2), treatment of acute deep vein thrombosis (1), treatment of acute scrotal pain (1), trigonocephaly (2), unilateral inguinal hernia repair (1), velopharyngeal (1), ventricular septal defect closure (1), video-assisted thyroidectomy (1)
(12) ORGAN TRANSPLANTS	Bone marrow (3), cadaveric (1), cryopreserved homografts (1), kidney (2), renal (7)
(13) SYNDROMES	Auto-immune polyendocrinopathy (1), auto-immune polyendocrinopathy-candidiasis-ectodermal dystrophy (1), Bertolotti's (1), cyclic vomiting (1), Hurler (1), Kawasaki (1), Pendred (1), Sturge-Weber (1), toxic shock (1), Turner (1)
(14) PREMATUREITY	Premature – infants (1)

Table 28: Case series – themed, non-classifiable, health-related outcomes (continued)

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(21) BIOLOGICAL MARKERS	Acute airway admissions (1), anomalous left coronary artery (1), antenatal diagnosis of pelvi-ureteric junction obstruction (1), cardiac murmurs (1), haemostatic response (1), hernia (2), inflammatory bowel disease – non-specific (1), internal hip rotation gait (1), kidney disease (1), laryngeal clefts (1), intestinal neuronal dysplasia (1), nasal foreign bodies (1), nostril stenosis (1), perivillous fibrinoid (1), refractory hypertension (1), rupture of the urethra (1), superior vena cava flow (1), translevator anal anomalies (1), trauma admissions (1), tumour necrosis factor alpha (TNFalpha) (1), tumours of the ovary – condition (1), variants in the paediatric orthopaedic population (1), vascular birth marks (1), ventricular stoma (1), neonatal seizures (1)

Descriptive studies that measured aspects of effectiveness

Of the studies that measured aspects of effectiveness, there were 41 audit studies (1.9%); 105 studies (4.8%) that examined the practice or knowledge of health professionals, health-related professionals or parents; 30 intervention studies (1.4%); and 11 validation studies (0.5%).

Among the 41 **audit studies**, 32 papers (1.5%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 9 (0.5%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: deaths (1); medical procedures (4); organ transplants (2); dental (1); and Other (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 29 and 30**.

Among the 105 studies that examined the **practice or knowledge of health professionals, health-related professionals or parents**, 13 papers (0.6%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 92 (4.2%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: psychology (1); sociology (3); breastfeeding (1); deaths (2); disabilities (1); health services (48); medical procedures (16); syndromes (1); education (7); dental (3); legal issues (6); and Other (4). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 31 and 32**.

Among the 30 **intervention studies**, 8 papers (0.4%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 22 (1%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (1); psychology (8); sociology (3); health services (1); medical procedures (1); diet and lifestyle (2); physical activity (1); education (2); dental (2); and biological markers (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 33 and 34**.

Among the 11 **validation studies**, 3 papers (0.1%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 9 (0.5%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (1); drugs (1); physical activity (1); and Other (6). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 35 and 36**.

Table 29: Audit studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [3] <ul style="list-style-type: none"> ☐ Viral infections characterised by skin and mucous membrane lesions – cytomegalovirus (1) ☐ Human immunodeficiency virus [HIV] disease (1) ☐ Other viral disease – viral warts (1)
E00-E90	Endocrine, nutritional and metabolic diseases [2] <ul style="list-style-type: none"> ☐ Other glycaemic control (1), unexplained hypoglycaemia (1)
G00-G99	Diseases of the nervous system [2] <ul style="list-style-type: none"> ☐ Episodic and paroxysmal disorders – epilepsy, status epilepticus (2)
L00-L99	Diseases of the skin and subcutaneous tissue [2] <ul style="list-style-type: none"> ☐ Other disorders of the skin and subcutaneous tissue – scleroderma (1) ☐ Disorders of skin appendages – ingrown toenails (1)
O00-O99	Pregnancy, childbirth and the puerperium [2] <ul style="list-style-type: none"> ☐ Antenatal care of high-risk patients (1) ☐ Timing of birth and obstetric and neonatal outcomes (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [1] <ul style="list-style-type: none"> ☐ Other congenital malformations of the digestive system – hypertrophic pyloric stenosis (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [1] <ul style="list-style-type: none"> ☐ Other – injuries (1)
V01-Y98	External causes of morbidity and mortality [4] <ul style="list-style-type: none"> ☐ Accidents – characteristics of all-terrain vehicles-related trauma (1) ☐ Accidents – paediatric burns, stab or gunshot wounds (2) ☐ Unclear – trauma (1)
Z00-Z99	Factors influencing health status and contact with health services [15] <ul style="list-style-type: none"> ☐ Persons encountering health services for examination and investigation (15)

Table 30: Audit studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(8) DEATHS	Perinatal and neonatal (1)
(11) MEDICAL PROCEDURES	Tonsillectomy (2), Hakim valve implants (1), gastroscopies (1)
(12) ORGAN TRANSPLANTS	Liver (1), cardiac (1)
(20) DENTAL	Oral disease in children with disability (1)
(23) OTHER	Fasting time in care-givers (1)

Table 31: Assessing knowledge and practice of professionals/parents – ICD-10

BLOCK	TITLE
E00-E90	Endocrine, nutritional and metabolic diseases [2] <ul style="list-style-type: none"> ☐ Diabetes mellitus – type 1 diabetes mellitus (1) ☐ Disorders of thyroid gland – Hashimoto's encephalopathy (1)
F00-F99	Mental and behavioural disorders [2] <ul style="list-style-type: none"> ☐ Behavioural and emotional disorders with onset usually occurring in childhood and adolescence – attention deficit hyperactivity disorder (1) ☐ Mental and behavioural disorders – psychiatric care (1)
J00-J99	Diseases of the respiratory system [3] <ul style="list-style-type: none"> ☐ Diseases of the respiratory system – asthma (3)
K00-K93	Diseases of the digestive system [1] <ul style="list-style-type: none"> ☐ Diseases of oesophagus, stomach and duodenum – infantile hypertrophic pyloric stenosis (1)

Table 31: Assessing knowledge and practice of professionals/parents – ICD-10 (*continued*)

O00-O99	Pregnancy, childbirth and the puerperium [1] <input type="checkbox"/> Pregnancy, childbirth and the puerperium – practices of obstetric intervention (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [1] <input type="checkbox"/> Congenital malformations of eye, ear, face and neck – congenital cataracts (1)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [2] <input type="checkbox"/> Abnormal findings on examination of blood, without diagnosis – haemochromatosis (1) <input type="checkbox"/> Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [1] <input type="checkbox"/> Injury (1)

Table 32: Assessing knowledge and practice of professionals/parents – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Sexual abuse – good practice in relation to youth who have experienced abuse (1)
(5) SOCIOLOGY	Critical incidents (1), domestic violence (1), men's abuse of women (1)
(7) BREASTFEEDING	Breastfeeding (1)
(8) DEATHS	Intensive care neonatal deaths (1), infant death necropsy reporting (1)
(9) DISABILITIES	Intellectual, physical and sensory disability among Traveller children (1)
(10) HEALTH SERVICES	Paediatric ambulatory assessment service (1), paediatric endocrine services (1), vaccinations (3), service quality health-promoting services (1), antibiotic and antifungal policies in neonatal units (1), antifungal prophylaxis (1), asthma prescribing pattern (1), current service configuration (1), antenatal care (1) Policies and practice: neonatal examination (1), neonatal intensive care (1), neonatal nutrition policies (1), neonatal service planning (1), palliative care (1), use of oesophageal and precordial stethoscopes for monitoring (1), resuscitation (1), oxygen in anaesthesia (1), propofol infusion (1), orthodontic (1), regional paediatric surgical services (1), spirometry measurements (1), maternity care (1), issues in regional neonatal units (1), neonatal seizures (1), non-accidental injury (1), paediatric non-accidental injury (1), psychiatric disorder (1), severe chronic lung disease (1), special needs children (1), parents with acute psychiatric illness (1), management of a screaming child with a penetrating eye injury (1), ethical decision-making in neonatal intensive care unit (1), general consultations (1), general paediatric surgery (1), genetic investigations (1), HIV-guidelines (1), Tx onsteroidal anti-inflammatory drugs (1), prescribing practices (1), radiation dose (1), Vitamin K (1), Vitamin K prophylaxis (1), intravenous fluids (1), anticoagulation (1), treatment of children (1), blood pressure (1), bronchiolitis (1)
(11) MEDICAL PROCEDURES	Anaesthesia (1), analgesia in dental practice (2), anaesthesia and immunisation (1), conscious sedation (1), impact of Cochrane Report on paediatric anaesthetic practice (1), episiotomy (1) Enteral tube feeding in the community (1), resuscitation of thermal injury (1), correct tracheal tube placement (1), blood gas monitoring (1), chronic lung disease oxygen requirements (1), insertion of central venous catheters (1), bone-anchored hearing aids (1), cochlear implants (1), trauma and orthopaedics (1)
(13) SYNDROMES	Androgen insensitivity syndrome inguinal hernias (1)
(19) EDUCATION	Education (5), literacy and competency (1), Index of Orthodontic Treatment Need (1)
(20) DENTAL	Avulsed permanent incisors (1), dental (1), dental caries (1)
(22) LEGAL ISSUES	Child abuse (2), child neglect (1), child physical abuse (2), child protection register (1)
(23) OTHER	Computer-related ergonomics (1), knowledge and accessibility of services to young families (1), radiography (1), child psychiatry (1)

Table 33: Intervention studies – ICD-10

BLOCK	TITLE
E00-E90	Endocrine, nutritional and metabolic diseases [2] <ul style="list-style-type: none"> □ Diabetes mellitus – type 1 diabetes mellitus (1) □ Obesity and other hyperalimentation – obesity (1)
F00-F99	Mental and behavioural disorders [3] <ul style="list-style-type: none"> □ Mental retardation – intellectual disabilities (1) □ Disorders of psychological development – learning disabilities (1) □ Behavioural and emotional disorders with onset usually occurring in childhood and adolescence – selective mutism (1)
J00-J99	Diseases of the respiratory system [1] <ul style="list-style-type: none"> □ Chronic lower respiratory diseases – asthma (1)
M00-M99	Diseases of the musculoskeletal system and connective tissue [1] <ul style="list-style-type: none"> □ Osteopathies and chondropathies – Perthes' Disease (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [1] <ul style="list-style-type: none"> □ Neural tube defects – condition (1)

Table 34: Intervention studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Staphylococcus aureus (1)
(4) PSYCHOLOGY	Sexual abuse – evaluate a group-based intervention (1), effectiveness of individual therapy (1) War, violence and conflict (1), bullying (1), children's behaviour and the levels of stress experienced by parents (1), poor social-emotional health (1), perceptual processes (1), exemplar training (1)
(5) SOCIOLOGY	Parenting programmes (1), family programme (1), sibling support programme (1)
(10) HEALTH SERVICES	Hospital infection (1)
(11) MEDICAL PROCEDURES	Cardiopulmonary resuscitation (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (2)
(18) PHYSICAL ACTIVITY	Switch Off – Get Active (1)
(19) EDUCATION	Education (2)
(20) DENTAL	Dental (2)
(21) BIOLOGICAL MARKERS	Reactions to sunscreen chemicals (1)

Table 35: Validation studies – ICD 10

BLOCK	TITLE
F00-F99	Mental and behavioural disorders [1] <ul style="list-style-type: none"> □ Disorders of psychological development – autism (1)
K00-K93	Diseases of the digestive system [1] <ul style="list-style-type: none"> □ Disorders of gall bladder, biliary tract and pancreas – hereditary pancreatitis (1)
R00-R99	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified [1] <ul style="list-style-type: none"> □ Ill-defined and unknown causes of mortality – Sudden Infant Death Syndrome (1)

Table 36: Validation studies – themed, non-classifiable health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED*
(1) MICROSCOPIC ORGANISMS	Metapneumovirus (1)
(6) DRUGS	Reliability of drug use reports (1)
(18) PHYSICAL ACTIVITY	Physical activity (1)
(23) OTHER	Child health questionnaire (1), Family Affluence Scale (1), Health of the Nation Outcome Scales for Children (1), gastric pepsin (1), parental recall (1), serum bilirubin (1)

* Discrepancy of 1

Descriptive studies with a health technology dimension

The last group of descriptive studies reported on the effectiveness of tools of measurement for the outcome of interest, on screening for the outcome of interest, on economic cost related to the outcome of interest, or the statistic on the sensitivity and specificity of a tool in measuring the outcome of interest.

Among the 31 **other study types – mainly related to measuring tools effectiveness**, all 31 papers (1.4%) examined the themed, non-classifiable, health-related outcomes. These outcomes included: psychology (4); sociology (1); health services (1); dental (2); and Other (23). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Table 37**.

Among the 24 **screening studies**, 16 papers (0.7%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 8 (0.4%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (1); organ transplants (2); prematurity (1); dental (2); and Other (2). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 38 and 39**.

Among the 12 **economic studies**, 5 papers (0.2%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 7 (0.3%) examined the themed, non-classifiable, health-related outcomes. The themed groupings, and the number of individually reported topics within these groups, were: microscopic organisms (1); health services (5); and medical procedures (1). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 40 and 41**.

Among the 32 **studies on the sensitivity and specificity of a measurement tool**, all 32 papers (1.5%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: microscopic organisms (6); and Other (26). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Table 42**.

Among the 40 **randomised controlled trials**, 22 papers (1%) reported health-related outcomes classified to one of the three- or four-digit rubric of ICD-10, while 18 (0.8%) examined the themed, non-classifiable, health-related outcomes. The themed groups, and the number of individually reported topics within these groups, were: psychology (4); medical procedures (12); and Other (2). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 43 and 44**.

Note: The discrepancy in numbers above reflects the one paper in the database which was a commentary and not a study.

Table 37: Other study types – mainly related to measuring tools effectiveness – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Children's Depression Inventory (2), cognitive distortions among sex offenders (1), perceptual assessment controlled speech stimuli (1)
(5) SOCIOLOGY	Children's Environmental Attitudes and Knowledge Scale (1)
(10) HEALTH SERVICES	Effectiveness of measurement tool – a logistic regression model to predict need for admission (1)
(20) DENTAL	Fluoride ingestion (2)
(23) OTHER	<p>Compilation of the Northern Ireland Cerebral Palsy Register (1), detection of multiple allergen-specific IgEs (1), determinants of radiation dose for helical CT (1), development of an optical biosensor inhibition immunoassay (1), ECG-based classifier system (1), multi-channel EEG-based neonatal seizure detection (1), Gaussian process modelling of EEG for the detection of neonatal seizures (1), effect of antimicrobial drug use and infection control practices on nosocomial MRSA (1), effective extraction procedure for three pupal neuropeptides (1), mathematically rigorous definition of pelvic angles (1)</p> <p>Molecular cytogenetic analysis (1), one-step multiplex PCR assay (1), PCR-RFLP subtyping methods (1), optical density (1), parent interview data – in the Millennium Cohort Study (1), polyacrylamide gel electrophoresis (1), quality in services (1), reconstructing 3D volume-reformatted 'transparency' images using insufflated air as a negative contrast medium (1), reproducibility of a standardised photographic technique for recording fluorosis (1), Stay Safe Programme (1), temperature sensitive of Y42H mutation in medium-chain acyl-CoA dehydrogenase (1), the feasibility of using glucometer measurement of blood glucose on fresh blood sample (1), three-dimensional transthoracic echocardiography (1)</p>

Table 38: Screening studies – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [3] <ul style="list-style-type: none"> <input type="checkbox"/> Tuberculosis and viral hepatitis – tuberculosis and hepatitis B (1) <input type="checkbox"/> Viral hepatitis – hepatitis B (1), hepatitis C (1)
C00-D48	Neoplasms [1] <ul style="list-style-type: none"> <input type="checkbox"/> Malignant neoplasms – leukaemia (1)
D50-D89	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism [2] <ul style="list-style-type: none"> <input type="checkbox"/> Antenatal and neonatal haemoglobinopathies (1) <input type="checkbox"/> Beta thalassaemia (1)
E00-E90	Endocrine, nutritional and metabolic diseases [3] <ul style="list-style-type: none"> <input type="checkbox"/> Other – neonatal thyroid-stimulating hormone (1), thyroid dysfunction (1) <input type="checkbox"/> Endocrine, nutritional and metabolic diseases or diseases of the digestive system – Addison's Disease and Coeliac Disease (1)
F00-F99	Mental and behavioural disorders [3] <ul style="list-style-type: none"> <input type="checkbox"/> Disorders of psychological development – autism (1) <input type="checkbox"/> Disorders of psychological development – learning disabilities (1) <input type="checkbox"/> Other – psychiatric disorders (1)
I00-I99	Diseases of the circulatory system [1] <ul style="list-style-type: none"> <input type="checkbox"/> Ischaemic heart disease (1)
N00-N99	Diseases of the genitourinary system [1] <ul style="list-style-type: none"> <input type="checkbox"/> Renal tubulo-interstitial diseases – vesicoureteric reflux (1)
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [1] <ul style="list-style-type: none"> <input type="checkbox"/> Neural tube defects – condition (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [1] <ul style="list-style-type: none"> <input type="checkbox"/> Toxic effects of substances chiefly non-medicinal as to source – lead toxicity (1)

Table 39: Screening studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Anti-parvovirus B19 (1)
(12) ORGAN TRANSPLANTS	Organ transplants – renal (2)
(14) PREMATUREITY	Premature – infants (1)
(20) DENTAL	Dental (2)
(23) OTHER	Algorithm – ‘musculoskeletal sepsis’ (1), multiple organ dysfunction score (1)

Table 40: Economic studies – ICD-10

BLOCK	TITLE
C00-D48	Neoplasms [1] <input type="checkbox"/> Malignant neoplasms – acute lymphoblastic leukemia (1)
H60-H95	Diseases of the ear and mastoid process [1] <input type="checkbox"/> Stapedial reflexes (1)
P00-P96	Certain conditions originating in the perinatal period [1] <input type="checkbox"/> Extreme premature birth (1)
S00-T98	Injury, poisoning and certain other consequences of external causes [2] <input type="checkbox"/> Injury (2)

Table 41: Economic studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Rotavirus (1)
(10) HEALTH SERVICES	Health service provision – transport (1), health service provision – re-admissions (1), health service provision – service use data (1), vaccinations (1), vaccination 7-valent pneumococcal conjugate (1)
(11) MEDICAL PROCEDURES	Cochlear implantation (1)

Table 42: Study of the sensitivity and specificity of a measurement tool – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(1) MICROSCOPIC ORGANISMS	Diagnostic tool laboratory – adenovirus (1), Burkholderia cepacia (2), E. sakazakii (2), norovirus (1)
(23) OTHER	Algorithms or statistical analysis to measure neonatal seizures (1), and gait (1), biological measure to assess encephalopathy (1), glucocorticoid measures (1), patent ductus arteriosus (1), in-hospital mortality (1), and a biomotion sensor to measure wrist-actimetry (1), endoscopy to examine rectal bleeding (1), duodenal biopsy (1), field technique to measure total energy expenditure (1), imaging techniques to measure chorionicity in twin pregnancies (1), and renal parenchymal defects (1), the quality of transmitted scans (1) Inclusion/exclusion criteria to assess the severity of disease (1), publication criteria in reporting on perinatal mortality (1), questionnaire or other measurement scale to examine Family Affluence Scale (1), food intake (1), quality of life (1), diagnostic tool laboratory to measure ranitidine hydrochloride (1), using doubly labelled water to measure energy intake and expenditure (1), and urea breath test to test for Helicobacter pylori (1), effectiveness of homeopathy treatment for otitis external (1), observer effectiveness in Mayo early language screening test (1), person and time – scoring levels (1), screening tool – predictability of herring classification (1), vaccinations – optimal strategy for mumps (1)

Table 43: Randomised controlled trials – ICD-10

BLOCK	TITLE
A00-B99	Certain infectious and parasitic diseases [1] <ul style="list-style-type: none"> □ Certain infectious and parasitic diseases – viral infections characterised by skin and mucous membrane lesions – warts (1) treatments
C00-D48	Neoplasms [2] <ul style="list-style-type: none"> □ Malignant neoplasms – leukaemia (1) treatments □ Malignant neoplasms – neuroblastoma (1) treatments
E00-E90	Endocrine, nutritional and metabolic diseases [1] <ul style="list-style-type: none"> □ Diabetes mellitus (1) screening
H00-H59	Diseases of the eye and adnexa [1] <ul style="list-style-type: none"> □ Disorders of choroid and retina – retinopathy of prematurity (1) treatments
K00-K93	Diseases of the digestive system [1] <ul style="list-style-type: none"> □ Diseases of appendix – appendectomy (1) treatments
L00-L99	Diseases of the skin and subcutaneous tissue [1] <ul style="list-style-type: none"> □ Other – dermatological care (1) treatments
O00-O99	Pregnancy, childbirth and the puerperium [2] <ul style="list-style-type: none"> □ Oedema, proteinuria and hypertensive disorders in pregnancy, childbirth and the puerperium – maternal hypotension (1) treatment □ Other – intrapartum meconium monitoring on managing pregnant women (1) screening
P00-P96	Certain conditions originating in the perinatal period [7] <ul style="list-style-type: none"> □ Respiratory and cardiovascular disorders specific to the perinatal period – lung disease (5) treatments □ Disorders related to length of gestation and foetal growth parenteral glutamine in pre-term neonates (1) treatments □ Other – ultrasound examination on the developing mother and child relationship (1) screening
Q00-Q99	Congenital malformations, deformations and chromosomal abnormalities [5] <ul style="list-style-type: none"> □ Congenital malformations and deformations of the musculoskeletal system – hip dysplasia (3) □ Congenital malformations of the circulatory system – congenital heart disease (1) screening □ Congenital malformations of the nervous system – dynamic equinus spasticity (1) treatments
S00-T98	Injury, poisoning and certain other consequences of external causes [1] <ul style="list-style-type: none"> □ Injuries to the elbow and forearm – radius buckle fractures (1) treatments

Table 44: Randomised controlled trials – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Evaluation of the effectiveness of programmes – interventions of smoking prevention programme (1), parental training programme (1), training programmes on life skills (1), community-based interventions of parenting skills (1)
(11) MEDICAL PROCEDURES	Evaluation of the effectiveness of procedures – airway maintenance (1), cardiotocography (1), chimaeric – analysis of molecular structures (1), consultation approach – mental health (1), interventions on nutrition on fruit and vegetable intake (1), intubation (1), glucose monitoring (1), prevention of blood contamination (1), tele-dermatology v. conventional assessment of clinical features (1), biophysical ultrasound in antenatal population (1), methods of assessing clinical hip instability (1), ventilation methods (1)
(23) OTHER	Evaluation of the effectiveness of treatments – anaesthetic drugs (1), wound dressing (1)

Qualitative studies

There were a total of 102 studies (100%) that examined outcomes using a qualitative methodology. Among these, 21 papers (20%) adopted a focus group approach and 10 (9.5%) employed an anthropological or ethnographical approach.

Some outcomes have been classifiable to one of the three- or four-digit rubric of ICD-10. However, as the studies themselves were qualitative in nature, outcomes are reported under the themed, non-classifiable, health-related outcomes. The themed groupings, and the number of individually reported topics within these groups, were: psychology (37); sociology (18); drugs (7); breastfeeding (1); disabilities (2); health services (8); diet and lifestyle (1); physical activity (1); education (8); dental (2); legal issues (14); and Other (3). Details of the classified outcomes and the individual topics aggregated to create the themed health-related outcomes are detailed in **Tables 45-47**.

Table 45: Qualitative studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Perceptions of risk (1), issues during pregnancy, childbirth and the puerperium: miscarriage or stillbirth (1), ultrasound diagnosis of foetal abnormality (1), women's experiences of receiving an adverse diagnosis at a routine second trimester ultrasound examination (1), congenital malformations, deformations and chromosomal abnormalities – neural tube defects (1), endocrine, nutritional and metabolic diseases, metabolic disorders – cystic fibrosis (1), mental and behavioural disorders, disorders of psychological development – learning disabilities (2), other psychological perspectives (12), mental and behavioural disorders, mental retardation – intellectual disabilities (2)
(5) SOCIOLOGY	Ethnicity (2), fathering role – after a relationship has ended (1), fathering role – among lesbian parents (1) Relationships – family and social support and early mother-child bonds (1), racial attitudes and identities (1), critical incident (1), perceptions of youth with mental health (1), war, violence and conflict (1)
(6) DRUGS	Drugs – alcohol (1), smoking (4), stimulant medication (1)
(9) DISABILITIES	Disabilities – questionnaires (1)
(10) HEALTH SERVICES	Health service provision (7), vaccinations (1)
(18) PHYSICAL ACTIVITY	Physical activity (1)
(19) EDUCATION	Education (8)
(20) DENTAL	Dental (1)
(22) LEGAL ISSUES	Adoption/foster care (3), legal and care issues (1), family support in the context of child protection work (1), sexual abuse – cognitions and the problematic use of the Internet (1), men convicted of downloading child pornography (1), therapists' experiences (1), children's rights (2), incarcerated babies (1), police officers (1)
(23) OTHER	Packaging materials used for foods (1), impact of research project (1), methodologies – the use of focus groups (1)

Table 46: Anthropological studies – themed, non-classifiable, health-related outcomes

GROUPING	WORKING DEFINITION
(4) PSYCHOLOGY	'Visible-ness' (1), intelligence (1), language (1), cystic fibrosis (1), the use of 'catch' questions (1)
(5) SOCIOLOGY	War, violence and conflict (1), racial and cultural adaptive mechanisms (2)
(9) DISABILITIES	Disability (1)
(7) BREASTFEEDING	Breastfeeding (1)

Table 47: Focus group studies – themed, non-classifiable, health-related outcomes

THEMED NON-CLASSIFIABLE HEALTH-RELATED OUTCOMES	SPECIFIC TOPICS ADDRESSED
(4) PSYCHOLOGY	Other – diseases of the nervous system – cerebral palsy (1), attitudes, needs, perceptions – families (1), first-time mothers (1), young people and risk (1), young women (1), educational psychology (1), professionals working with children – staff mental health link worker for adolescents (1), views of social workers using a ‘systematic assessment of the psychological and emotional needs of children on the edge’ (1), living with or caring for individuals with depression (1), self-harm (1)
(5) SOCIOLOGY	Children’s perceptions of – domestic violence (1), sectarianism (1), growing up in Northern Ireland (1), the right to work (1), issues of masculinity in disadvantaged areas (1), promotion of health and social well-being (1)
(6) DRUGS	Drugs – attitudes to use (1)
(17) DIET AND LIFESTYLE	Diet and lifestyle (1)
(20) DENTAL	Dental (1)
(22) LEGAL ISSUES	Child protection (1), children’s interests and their rights following parental separation (1)

Demographic characteristics of the study population

Characteristics of the study population consisted of person type, population type and the geographical location of the study population.

Person and population types

The person and population characteristics of the study population consisted of (*see Table 48*):

- **Mother–infant dyad**, mainly in a hospital setting. The time periods in which this pairing was examined included the period during pregnancy, the delivery period or the puerperium period (the first 6 weeks of life).
- **Children and adult populations** in a hospital setting, mainly undergoing treatment for pathological conditions.
- **School-aged children** in the general population, including nursery (under 4 years), primary (4-12 years) and secondary school (13-18 years).
- **Other populations**, including health and other professional groups (such as teachers, parents) and sex offenders.

Overall, 5.8% of the studies examined a mother–infant dyad, the mother during pregnancy, the mother and child during delivery or the child in a hospital setting in the first 6 weeks of life. The percentage of studies undertaken in this setting ranged from 1% (among epidemiological studies investigating incidence or prevalence) to 17% (among studies examining the sensitivity or specificity of a measurement tool). Other studies that examined outcomes in this population included, in ascending order of magnitude, comparison studies, cross-sectional studies, case series, qualitative studies, case control studies, case studies, screening studies and audits.

At 39.5%, studies conducted in a hospital setting represented the second most frequently studied population type grouping. The percentage of hospital-based studies ranged from 10% (in studies of a cross-sectional nature) to 100% (in studies with an economic dimension).

Just over 13% of the studies reported outcomes in school-aged children. While it was not the case for all outcomes examined, in general, this represented a population with non-pathological measures of health and was representative of the general population for their specific demographic characteristics of age and sex. The percentage of studies undertaken in this population ranged from 6% to 45%, with randomised

controlled trials and qualitative studies sitting at the lower end of the scale, and intervention studies at the upper end. Other studies that examined outcomes in this population type included, in ascending order of magnitude, case studies, screening studies, cohort studies, other studies – mainly related to measuring the effectiveness of tools, validation studies and cross-sectional studies.

The final population grouping, 'other populations', consisted of:

- children who were a specific outcome of interest, along with other family members;
- health and health-related professionals examined regarding their knowledge or skills in a specific area;
- parents, or other family members, regarding the impact of living with an individual with a specific condition;
- sex offenders.

These 'other' groups represented 41% of the population types from the study papers examined. Among the study types that assessed issues of practice – including longitudinal studies, reports from legal cases and focus group studies – this heterogeneous study population type represented 90% or more of the studied population.

Table 48: Person and population characteristics of the study population stratified by study type

STUDY TYPE	HOSPITAL (MOTHER AND CHILD)	HOSPITAL (CHILDREN AND ADULTS)	SCHOOL-AGED POPULATION	OTHER POPULATIONS	DETAILS OF 'OTHER POPULATIONS'
Audit	15%	69%	0%	16%	<ul style="list-style-type: none"> • Children other than children attending hospital or special clinic. • Children with an intellectual disability, athletic, healthy purposeful sampling, offspring of opium users, victims of sexual abuse. • Families – of children with a disability consisting of triads (mother, father, child groups) and index or proband case (i.e. the child with the outcome of interest). The most common disabilities were attention hyperactive deficit disorder, autism and neural tube defect. • Health professionals – e.g. medical doctors, surgeons, physicians, psychiatrists, general practitioners, nurses, midwives, public health nurses, other healthcare workers, psychologists. • Other professionals – e.g. teachers, social workers. • Other persons – perpetrators of sexual abuse (sex offenders).
Assessing practice/knowledge	0%	0%	0%	100%	
Case control study	12%	67%	0%	21%	
Case study	12.5%	42%	6.8%	38.7%	
Case series	8.5%	91.5%	0%	0%	
Case report	16%	78%	0%	6%	
Cohort study	25%	25%	25%	25%	
Comparison study	2%	82%	6%	10%	
Cross-sectional study	2.5%	10%	39%	48.5%	
Economic study	0%	100%	0%	0%	
Epidemiology studies	1%	71%	15%	13%	
Intervention studies	0%	0%	45%	55%	
Legal notes	0%	0%	0%	100%	
Longitudinal studies	0%	0%	0%	100%	
Other studies	0%	32%	30%	38%	
Randomised controlled trials*	5%	35%	6%	5%	
Qualitative study	9.3%	0%	25%	65.6%	
Screening studies	14%	43%	7%	36%	
Sensitivity and Specificity studies	17%	18%	0%	65%	
Surveillance studies	0%	50%	0%	50%	
Validation studies	0%	29%	36%	35%	
Focus studies	0%	0%	10%	90%	
Qualitative studies, including anthropology and ethnography work	0%	33%	34%	33%	
TOTAL (100%)	5.8%	39.5%	13.4%	41.3%	

* Some randomised controlled trials (RCT) were followed up as cohort studies after the initial trial was completed.

Geographical location of the study population

Taking each paper as representative of an individual population group, the geographical distribution of the studied populations was (see Table 49):

- Republic of Ireland – 60% (n = 1,296);
- Northern Ireland – 23% (n = 495);
- Northern Ireland and Republic of Ireland – 0.7% (n = 15);
- Republic of Ireland and the United Kingdom (UK) – 6% (n = 137);
- Republic of Ireland and geographical regions outside the UK (international) – 7% (n = 142);
- United Kingdom inclusive of Northern Ireland – 3% (n = 71).

Note that the geographical distribution of all populations studied differed when examined as an aggregate, as opposed to the geographical distribution of the population within each of the individual study types. The various study types, stratified by geographical population distribution, are presented below.

- **Case control studies**
The 163 papers (7.5%) represented findings from the Republic of Ireland (n = 136); Northern Ireland (n = 12); Republic of Ireland and UK (n = 4); Republic of Ireland and geographical regions outside the UK (n = 5); and the UK inclusive of Northern Ireland (n = 4).
- **Cohort and longitudinal studies**
The 46 papers (2%) represented findings from the Republic of Ireland (n = 15); Northern Ireland (n = 17); Northern Ireland and Republic of Ireland (n = 1); Republic of Ireland and UK (n = 9); Republic of Ireland and geographical regions outside the UK (n = 1); and the UK inclusive of Northern Ireland (n = 3).
- **Comparison studies**
- The 101 papers (4.6%) represented findings from the Republic of Ireland (n = 43); Northern Ireland (n = 25); Republic of Ireland and UK (n = 3); Republic of Ireland and geographical regions outside the UK (n = 21), the UK inclusive of Northern Ireland (n = 8); and the USA (n = 1).
- **Epidemiology studies of incidence, prevalence and/or trends**
The 149 papers (6.9%) reporting measure of incidence, prevalence and/or trends represented findings from the Republic of Ireland (n = 65); Northern Ireland (n = 27); Northern Ireland and Republic of Ireland (n = 5); Republic of Ireland and UK (n = 28); Republic of Ireland and geographical regions outside the UK (n = 13); the UK inclusive of Northern Ireland (n = 11); and Scotland (n = 1).
- **Case reports**
The 302 papers (14%) represented findings from the Republic of Ireland (n = 245); Northern Ireland (n = 55); Northern Ireland and Republic of Ireland (n = 1); and Republic of Ireland and geographical regions outside the UK (n = 1).
- **Case studies**
The 664 papers (30.7%) represented findings from the Republic of Ireland (n = 358); Northern Ireland (n = 194); Northern Ireland and Republic of Ireland (n = 2); Republic of Ireland and UK (n = 38); Republic of Ireland and geographical regions outside the UK (n = 49); and the UK inclusive of Northern Ireland (n = 22).
- **Cross-sectional studies**
The 57 papers (2.6%) represented findings from the Republic of Ireland (n = 32); Northern Ireland (n = 8); Northern Ireland and Republic of Ireland (n = 2); Republic of Ireland and geographical regions outside the UK (n = 13); and the UK (n = 2).



- **Surveillance studies**
The 16 papers (0.7%) represented findings from the Republic of Ireland (n = 11); and the Republic of Ireland and geographical regions outside the UK (n = 5).
- **Case series studies**
The 223 papers (10.3%) represented findings from hospital-based populations in the Republic of Ireland (n = 184); Northern Ireland (n = 29); Republic of Ireland and UK (n = 7); the UK (n = 2); and the USA (n = 1).
- **Audits**
The 41 papers (1.9%) represented findings from the Republic of Ireland (n = 31); Northern Ireland (n = 5); Republic of Ireland and UK (n = 2); and the UK (n = 3).
- **Assessment of practice or knowledge of professionals working with children**
The 105 papers (4.8%) represented findings from the Republic of Ireland (n = 42); Northern Ireland (n = 22); Northern Ireland and Republic of Ireland (n = 2); Republic of Ireland and UK (n = 27); Republic of Ireland and geographical regions outside the UK (n = 5); and the UK inclusive of Northern Ireland (n = 7).
- **Intervention studies**
The 30 papers (1.4%) represented findings from the Republic of Ireland (n = 13); Northern Ireland (n = 14); Republic of Ireland and geographical regions outside the UK (n = 1); and the UK inclusive of Northern Ireland (n = 2).
- **Validation studies**
The 11 papers (0.5%) represented findings from the Republic of Ireland (n = 6); Northern Ireland (n = 3); Republic of Ireland and geographical regions outside the UK (n = 1); and the UK inclusive of Northern Ireland (n = 1).
- **Other studies – mainly related to the effectiveness of measurement tools**
The 31 studies (1.4%) that examined the effectiveness of diagnostic measurement tools represented findings from international papers (n = 3); Northern Ireland (n = 11); Republic of Ireland (n = 13); Republic of Ireland and Northern Ireland (n = 3); and the UK (n = 1).
- **Screening studies**
The 24 studies (1.1%) that screened for a range of health-related outcomes represented findings from Northern Ireland (n = 6) and the Republic of Ireland (n = 18).
- **Economic studies**
The 12 studies (0.5%) that examined economic costings represented findings from international papers (n = 2); Northern Ireland (n = 2); Republic of Ireland (n = 6); Republic of Ireland and UK (n = 1); and the UK (n = 1).
- **Studies measuring the sensitivity and specificity of a measurement tool**
The 32 studies (1.5%) reporting on the sensitivity and specificity of a measurement tool represented findings from international papers (n = 4); Northern Ireland (n = 14); Republic of Ireland (n = 11); Republic of Ireland and Northern Ireland (n = 2); and the UK (n = 1).
- **Randomised controlled trials**
The 41 randomised controlled trials (1.9%) represented findings from international papers (n = 5); Northern Ireland (n = 10); Republic of Ireland (n = 15); Republic of Ireland and UK (n = 10); and the UK (n = 1).
- **Qualitative studies**
The 102 qualitative studies (4.7%) represented findings from the Republic of Ireland (n = 50); Northern Ireland (n = 35); Northern Ireland and Republic of Ireland (n = 2); Republic of Ireland and UK (n = 3); Republic of Ireland and geographical regions outside the UK (n = 10); and the UK inclusive of Northern Ireland (n = 2).

Table 49: Study population stratified by study type and geographical location

STUDY TYPE	REPUBLIC OF IRELAND	NORTHERN IRELAND	NORTHERN IRELAND AND REPUBLIC OF IRELAND	REPUBLIC OF IRELAND AND UNITED KINGDOM	INTERNATIONAL*	UNITED KINGDOM	TOTAL
Randomised controlled trial	15 (0.7%)	10 (0.5%)		10 (0.5%)	5 (0.2%)	1 (0.05%)	41 (2%)
Sensitivity and specificity studies of a measurement tool	11 (0.5%)	14 (0.6%)		2 (0.1%)	4 (0.2%)	1 (0.05%)	32 (1.5%)
Audit	31 (1.4%)	5 (0.2%)		2 (0.1%)		3 (0.1%)	41 (2%)
Case control study	137 (6.3%)	12 (0.5%)		4 (0.2%)	5 (0.2%)	4 (0.2%)	162 (7.5%)
Case report	245 (11.3%)	55 (2.6%)	1 (0.05%)		1 (0.05%)		302 (14%)
Case series study	184 (8.5%)	29 (1.3%)		7 (0.3%)	1 ^{USA} (0.05%)	2 (0.1%)	223 (10.3%)
Case study	358 (16.6%)	194 (9%)	2 (0.1%)	38 (1.8%)	49 ^{plus Scotland 1} (2.3%)	22 (1.02%)	664 (31%)
Cohort study	11 (0.5%)	4 (0.2%)		9 (0.4%)	1 (0.05%)	2 (0.1%)	27 (1.3%)
Comparison study	43 (2%)	25 (1.2%)		3 (0.1%)	21 ^{plus USA 1} (1%)	8 (0.4%)	101 (4.7%)
Cross-sectional study	32 (1.5%)	8 (0.4%)	2 (0.1%)		13 (0.6%)	2 (0.1%)	57 (2.6%)
Economic study	6 (0.3%)	2 (0.1%)		1 (0.05%)	2 (0.1%)	1 (0.05%)	12 (0.6%)
Epidemiology – descriptive, incidence, prevalence and/or trends	65 (3%)	27 (1.3%)	5 (0.2%)	28 (1.3%)	13 (0.6%)	11 (0.5%)	149 (7%)
Intervention study	13 (0.6%)	14 (0.6%)			1 (0.05%)	2 (0.1%)	30 (1.4%)
Legal notes		6 (0.3%)					6 (0.3%)
Longitudinal study	4 (0.2%)	13 (0.6%)	1 (0.05%)			1 (0.05%)	19 (0.9%)
Other study type – mainly related to the effectiveness of measurement tools	13 (0.6%)	11 (0.5%)		3 (0.1%)	3 (0.1%)	1 (0.05%)	31 (1.4%)
Qualitative study, including anthropology and ethnography work	40 [6] [4]** (2.3%)	20 [11] [4] (1.6%)	2 [0] [0] (0.1%)	2 [1] [0] (0.1%)	6 [2] [2] (0.05%)	1 [1] [0] (0.05%)	102 (4.7%)



Table 49: Study population stratified by study type and geographical location (*continued*)

STUDY TYPE	REPUBLIC OF IRELAND	NORTHERN IRELAND	NORTHERN IRELAND AND REPUBLIC OF IRELAND	REPUBLIC OF IRELAND AND UNITED KINGDOM	INTERNATIONAL*	UNITED KINGDOM	TOTAL
Screening study	18 (0.8%)	6 (0.3%)					24 (1.1%)
Practice/ knowledge of professionals or parents	42 (2%)	22 (1%)	2 (0.1%)	27 (1.3%)	5 (0.2%)	7 (0.3%)	105 (4.9%)
Surveillance study	11 (0.5%)				5 (0.2%)		16 (0.7%)
Validation study	7 (0.3%)	3 (0.1%)			1 (0.05%)	1 (0.05%)	12 (0.6%)
TOTAL (%)	1,296 (60%)	495 (23%)	15 (0.7%)	137 (6%)	142 (7%)	71 (3%)	2,156 (100%)

* Studies under the heading 'International' but represented by only one country (e.g. USA) indicate studies where there is some ambiguity regarding the nationality of the studied population.

** The subtotals in square brackets (e.g. [6] [4]) represent the number of anthropological and ethnographic studies, respectively, included in the study type 'Qualitative study'.



4 Discussion



Overview of principal findings

In the period 2000 to 2008, 3,229 peer-reviewed articles, published in 1,003 scientific journals (*see Appendix 2*), were identified which fulfilled the study's inclusion criteria. The articles reported findings from 2,156 primary research studies; the remaining 1,073 articles discussed health-related outcomes, reported findings from secondary research or reported primary research findings on animals. The primary research peer-reviewed articles were examined to identify the nature of the research, demographic characteristics of the studied populations and the nature of the health-related outcomes examined. Analytical and descriptive methodologies were employed to understand the distribution and determinants of health-related outcomes.

The peer-reviewed research reported on a diverse array of health-related topics. Specific health-related topics were examined using aetiological and descriptive study designs. National, cross-border and international studies were reviewed. There was a strong health technology assessment dimension to the work. Four types of study population were observed:

- a mother–infant dyad and child–adult grouping, both of which were hospital-based;
- schoolchildren of various ages;
- a heterogeneous grouping consisting of one or more of the following types: children, siblings, parents, health-related professionals, other professionals;
- a final, rather idiosyncratic group – including sex offenders.

Nature of the research

Study type

There were 209 papers (9.7%) of an aetiological nature and 1,941 papers (90%) that described outcomes but did not address specific issues of causality, although many study papers made comparisons for a range of demographic characteristics. The descriptive papers consisted of studies with (9.7%), and without (58.8%) a comparative dimension; studies that examined aspects of effectiveness (8.7%) – either the assessment of practice and knowledge of professionals working with children or children's family members, or the evaluation of health-related interventions or treatments; and finally, studies that had a health technology dimension (6.5%).

- **Case control and cohort studies**
Papers indexed as aetiological in nature consisted of 163 case control studies (7.5%) and 46 cohort studies of a longitudinal nature (2%).
- **Comparison studies, epidemiological studies measuring prevalence, incidence and/or trends, case reports, case studies, cross-sectional studies, surveillance studies and case series studies**
Descriptive studies *with* a comparison dimension included 101 studies (4.6%) that compared findings for the health-related outcome of interest across time, geographical region or treatment type; and 149 studies (6.9%) reporting measures of incidence, prevalence and/or trends.

Descriptive studies *without* a comparative dimension (58.8%) consisted of case reports, case studies, cross-sectional studies, surveillance studies and case series studies.
- **Audits, practice or knowledge of professionals or parents, intervention studies and validation studies**
Descriptive studies that examined aspects of effectiveness (8.7%) included audit studies; studies that reported on the practice or knowledge of professionals, parents or other adults working, or associated, with children; studies that examined health interventions; and studies that assessed the validity of a measurement tool.



- **Other studies – mainly related to measuring tools effectiveness, screening studies, economic studies, studies on the sensitivity and specificity of a measurement tool, and randomised controlled trials**
Studies with a health technology dimension (6.5%) examined the effectiveness of a measurement tool, screened for a range of health-related outcomes, inspected economic costs of specific treatments or procedures, examined the sensitivity and specificity of a measurement tool and/or evaluated the effectiveness of treatments using randomised controlled trial methodologies.

Demographic characteristics

- **Population type**
The majority of study populations were hospital-based (46%), of which 6% reported on mother–infant dyad during pregnancy or the peripartum period. The outstanding hospital-based populations represented child–adult combinations with specific pathological conditions requiring treatment or follow-up. Health-related outcomes or behaviours among school-aged children accounted for just over 13% of the studied papers. The remaining population type, representing 41.3% of the study papers, comprised heterogeneous groupings of various cluster types and cluster numbers. These clusters were comprised of children, parents, siblings, teachers, health professionals, other professionals working with children and sex offenders.
- **Geographical distribution**
The majority of papers – 1,296 (60%) – studied populations from the Republic of Ireland. The remaining populations were from Northern Ireland (495 or 23%), the geographic island of Ireland (15 or 0.7%), the political region of the United Kingdom (71 or 3%) and international groups (142 or 7%) where, in addition to an Irish population, a population from at least one other country outside Ireland and the UK was examined.

Health-related outcomes

There were 1,220 different health-related outcomes reported in the 2,156 papers. ICD-10, or to a much lesser extent ICD-O-3, accounted for the method of classification for 962 (45%) of the 2,156 study papers. The remaining 1,194 study papers (55%) examined the themed, non-classifiable, health-related outcomes of: microscopic organisms; measures of immunology and neurology; measures of a psychological or sociological nature; a range of behavioural practices, including issues related to drug use, breastfeeding, diet and lifestyle and physical activity. Other outcomes examined included generic outcomes of death and various disabilities; issues related to organ transplant and prematurity; biological markers; measures of anatomy; a range of syndromes; health services issues; dental outcomes; normal and abnormal patterns of growth and development; issues related to education; a small number of legal issues; and a final heterogeneous group called 'Other' representing outcomes not embodied in the other categories.

Full details on each of the papers included in the study are available on the website www.childrensdatabase.ie/Irish-child-health-database/.

Individual studies – main features

Key features of health-related outcomes and demographic characteristics by study types examined are presented below.

- **Case control and cohort studies**
The ICD-10 four-digit rubric of Attention Deficit Hyperactivity Disorder (ADHD), reflux nephropathy, congenital diaphragmatic hernia, congenital hypertrophic pyloric stenosis, neural tube defect, Hirschsprung's Disease and Sudden Infant Death Syndrome accounted for 54 of the case control papers. A further 93 case control papers, accounting for almost half of the studies examined,



looked at risk factors for 'endocrine, nutrition and metabolic disease', 'mental and behavioural disorders', 'diseases of the musculoskeletal system and connective tissue', 'symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified' and 'congenital malformations, deformations and chromosomal abnormalities'. The remaining 27 papers examined three or less risk factors among ICD-10 classified outcomes. The 35 themed health-related outcomes concentrate predominantly on the areas of: microscopic organisms, immunology and sociology. However, only one risk factor for each of the individual outcomes was examined.

The most commonly investigated outcomes in the cohort studies were health-related outcomes among infants born to a cohort of pregnant women who were HIV-positive. In total, 5 HIV-related outcomes were examined. The remaining areas of interest represented a total of 42 different health-related outcomes in the physical, mental, sociological, behavioural and health service provision areas. Case control studies mainly reported outcomes on hospital-based patients (79%), of which 12% were mother–infant dyads. Cohort study populations were split evenly across the four population types (hospital-based population, including mother–infant dyad; school-based population; and mixed populations of adults and children), while those of a longitudinal nature represented persons working with children or other population types.

- **Comparative studies**

Less than half of the 101 comparative studies examined ICD-10 classifiable outcomes. The remaining 61 papers examined themed, health-related outcomes. The comparisons made included contrasting measures of time, geography and a range of socio-demographic characteristics. In general, the time comparison compared findings from two periods, often comparing outcomes before and after the introduction of a new procedure. Geographical comparisons were national and international. The socio-demographic characteristics represented a range of measures of socio-economic position, cultural backgrounds and measures of education. Various aspects of health service provision, including the type of treatment or types of procedures, were compared. In the main, comparison studies reported findings from hospital-based populations (82%).

- **Epidemiology studies of incidence, prevalence and/or trends, and cross-sectional studies**

Epidemiology studies and cross-sectional studies reported measures of prevalence, incidence and/or trends of disease. The epidemiological studies reporting on international populations reported measures of health-related outcomes with regard to body size, injury, bullying, metabolic outcomes, congenital malformations, psychiatric care and suicide. For many of these outcomes, findings were based on representative populations of schoolchildren or from data registers which allowed population representative estimates of statistical measures. The predominantly national epidemiology studies reported findings mainly from a hospital-based population (71%). The remaining population type reported findings from school populations and persons working with, or involved with, children. The cross-sectional studies focused on school populations (39%) or persons working with, or involved with, children and family members (48.5%).

- **Case reports and case series studies**

Case reports identified unusual treatments or characteristics for a disease in one person or a family – 192 ICD-10 classifiable outcomes were reported and almost 70 themed, health-related outcomes. Case series studies reported findings on hospital-based populations with regard to the treatment of a range of health-related outcomes. The treatments included pharmacological and surgical interventions, and imaging techniques. Case reports and case series papers reported outcomes on hospital-based patients (100%), of which between 8% and 16%, respectively, represented a mother–infant dyad.



- **Case studies**

The case studies examined 398 themed non-classifiable outcomes. The most frequently occurring outcomes were: bacteria, virus and fungi (37); biological markers and measures of anatomy (41); education (22); health service provision (40); medical procedure (21); psychology and sociological issues (64); legal issues – adoption, abuse, neglect (22); and Other (44). Among the 266 ICD-10 classifiable health-related outcomes, the most frequently occurring outcomes were: certain infectious and parasitic diseases (24); congenital malformations, deformations and chromosomal abnormalities (33); diseases of the genitourinary system (8); diseases of the musculoskeletal system and connective tissue (11); diseases of the nervous system (20); diseases of the respiratory system (15); endocrine, nutritional and metabolic disease (20); injury, poisoning and certain other consequences of external causes (22); mental and behavioural disorders (48); and pregnancy, childbirth and the puerperium (25). Populations for the case studies were divided across the four population types, with a hospital-based population (42%) and persons working with, or involved with, children and family members (39%) representing the greatest proportion of these groupings.

- **Surveillance studies**

The surveillance studies reported on a range of diseases of an infectious nature, or in a small number of papers on vaccination processes.

Assessment of aspects of effectiveness regarding knowledge or practice in relation to health-related outcomes

- **Audit**

Audits of adherence to guidelines, of procedures or of knowledge on treatments for a range of health-related outcomes were undertaken. The majority of audits were conducted in a hospital setting and included issues related to dysplasia of the hip; glucose metabolism; the provision of hospital services for injuries and day-surgery; orthodontic treatment; transportation; burns; and status epilepticus. An audit of emergency contraception use among Irish teenagers was also undertaken.

- **Practice or knowledge of health professionals**

The practice or knowledge of health professionals working with children was assessed in relation to an array of factors, including antenatal care, anaesthesia, blood transfusion and steroid use. Studies also examined the knowledge and practice of teachers in an educational setting or other health-related workers, such as social workers.

- **Intervention studies**

A range of healthcare interventions was evaluated with regard to asthma treatment, including issues related to oral health and treatments for fungal and bacterial infections. Areas of family support where children had significant learning and intellectual disabilities or behavioural problems were also examined. Interventions were evaluated in hospital settings, in the community or in school settings.

- **Validation studies**

The validity of the Family Affluence Measurement Scale, of recall among parents and adolescents, and of laboratory diagnostic tests was examined. Studies were evaluated in school populations (45%) and persons working with, or involved with, children and family members (55%).



Papers with health technology dimension

- **Other studies – mainly related to measuring tools effectiveness**

An examination was undertaken on the effectiveness of a range of diagnostic laboratory tests, the completeness of data registers or information systems, changes in sensitivity and specificity estimates across a range of demographic characteristics and the positive predicative value of specific biological markers in relation to a range of health-related outcomes.
- **Screening studies**

Screening was undertaken for dental outcomes, genetic mutations, polymorphisms, congenital malformations, mental and behavioural disorders and a range of viruses. The majority of screening programmes were undertaken on hospital-based populations, but also included persons working with, or involved with, children and family members.
- **Economic studies**

The economic costs were evaluated for injury-related hospital admissions, pharmacogenomics for acute lymphoblastic leukaemia, cochlear implants, patients' transports costs, vaccination programmes and other health-related programmes. Cost-effective studies were undertaken in hospital-based populations.
- **Studies on the sensitivity and specificity of a measurement tool**

The sensitivity and specificity of a range of questionnaires, across a variety of topics, were evaluated. The accuracy of tools employed in measuring energy intake and radiograph imaging techniques was assessed. The effectiveness of early language screening tests and measures of socio-economic position were also reported.
- **Randomised controlled trials**

Randomised controlled trials (RCTs) were reported on treatments among premature infants of chemotherapies for neuroblastoma and severe aplastic anaemia, imaging techniques, interventions for nutrition in premature infants, glucose monitoring in pregnant women, intervention programmes for children with intellectual disabilities, smoking educational programmes and parental training programmes. In the Republic of Ireland, both hospital-based and community-based trials were undertaken. Some RCT populations were followed up over time and in effect these studies are more accurately described as cohort studies. The hospital-based trials included evaluation of surgical and imaging techniques and of specific treatments. The community-based trials evaluated smoking educational programmes.

Strengths and weaknesses of the study

This study maps all the peer-reviewed health research papers on children in Ireland published over a 9-year period. The nature of the study allows not only a comprehensive view of the health-related topics examined, but also, by examining the topics stratified by study type, gives a picture of how this research informs various aspects of healthcare provision – including epidemiology, public health, health technology assessment, surveillance and education. The systematic search strategy limits the potential for missing data and the picture provided should be regarded as a current depiction of the nature of health research on children in Ireland with regard to the peer-reviewed literature.

The principal method of presentation – by study type – was deliberately chosen to provide an appreciation of the nature of research in Ireland. The case control and cohort studies examined specific risk factors for a range of health-related outcomes. Epidemiology studies of incidence, prevalence and/or trends and cross-sectional studies estimated statistical measures of disease. Case studies, case reports and case series



studies allowed a better characterisation of a range of outcomes, but the nature of the populations studied reflected limitations in the degree to which study findings could be generalised. The surveillance studies undertook a rapid assessment of the nature of a range of infectious disease outbreaks.

The subsequent studies under the umbrella grouping of 'Assessment of aspects of effectiveness regarding knowledge or practice in relation to health-related outcomes' and studies with a health technology dimension examined issues that facilitated the accurate measurement of factors associated with health-related outcomes, rather than health-related outcomes themselves. Broadly speaking, they included evaluation of medical or health-related knowledge, intervention studies for medical or health-related treatments, the effectiveness of screening studies, economic cost of studies and evaluation of best treatment or intervention.

The second method of presentation – by study topic – provides a count of the total number of papers and the total number of topics examined. However, there are a number of difficulties in mapping research by this method. Reporting on the nature of the topic says little about the nature of the research with regard to aetiology, measures of disease frequency or the representativeness of the study, even though two of these issues are addressed through the examination of study type and population type. No reference is made with regard to the risk factors examined, and little reference is made to the nature of the determinates, controlled for in aetiological studies or examined in the comparative studies to assess equality. The nature of the statistical analysis employed in the papers is not examined and therefore measures of estimates of effect are not reported. Neither are issues of representativeness or generalisability examined – important factors in contextualising the relevance of the study findings. However, it was clear that a wide range of health-related outcomes – over 1,220 – was examined in the study period. Nevertheless, counts tell little with regard to the measure of the magnitude of the problem posed by each health-related outcome within the population, among persons with the disability of interest, or of the cost to society of the factor of interest. Investigation of other information systems is required for this.

More structured methods to group the themed, non-classified, health-related outcomes are required. Each of the thesauruses employed in the bibliographic databases employs different criteria for creating subcategories and categories. A more rigorous understanding of the rationale behind such categories and justification in choosing a specific method is required to provide internationally comparable groupings of those outcomes not classifiable to ICD-10.

One approach to this will be the application of the methodological approaches of and findings from the RICHE project ('Research Inventory of Child Health in Europe'). This EU project will '*address the diversity and fragmentation of child health research in Europe, by establishing an innovative, iterative and sustainable European platform for child health research across different disciplines*'. (It arose in response to the European Union's 7th Framework Programme for Research and Technological Development (FP7), covering the years 2007-2013.) This integrated virtual platform will help the different stakeholders to build the future of European child health research and thus promote child health in Europe and beyond. The core of the RICHE project is the development of the platform – the public face of the project – and this part of the work (called Work Package 5 or WP5) is being led by Professor Anthony Staines of Dublin City University, with Dr. Anne McCarthy of the Irish Health Research Board as Deputy Lead. Among its objectives is the development of a more structured method of indexing child health-related research, with a focus on grey literature. Findings from RICHE will be used to update the work identified in this present child health mapping project. For more information, see www.childhealthresearch.eu/about-us/project-overview.

The third method of presentation – by population type – clearly demonstrates the predominantly hospital-based nature of the study groups. This population can be stratified into two groups: one group comprised a mother-child dyad from the prenatal and antenatal period, while the second group comprised populations



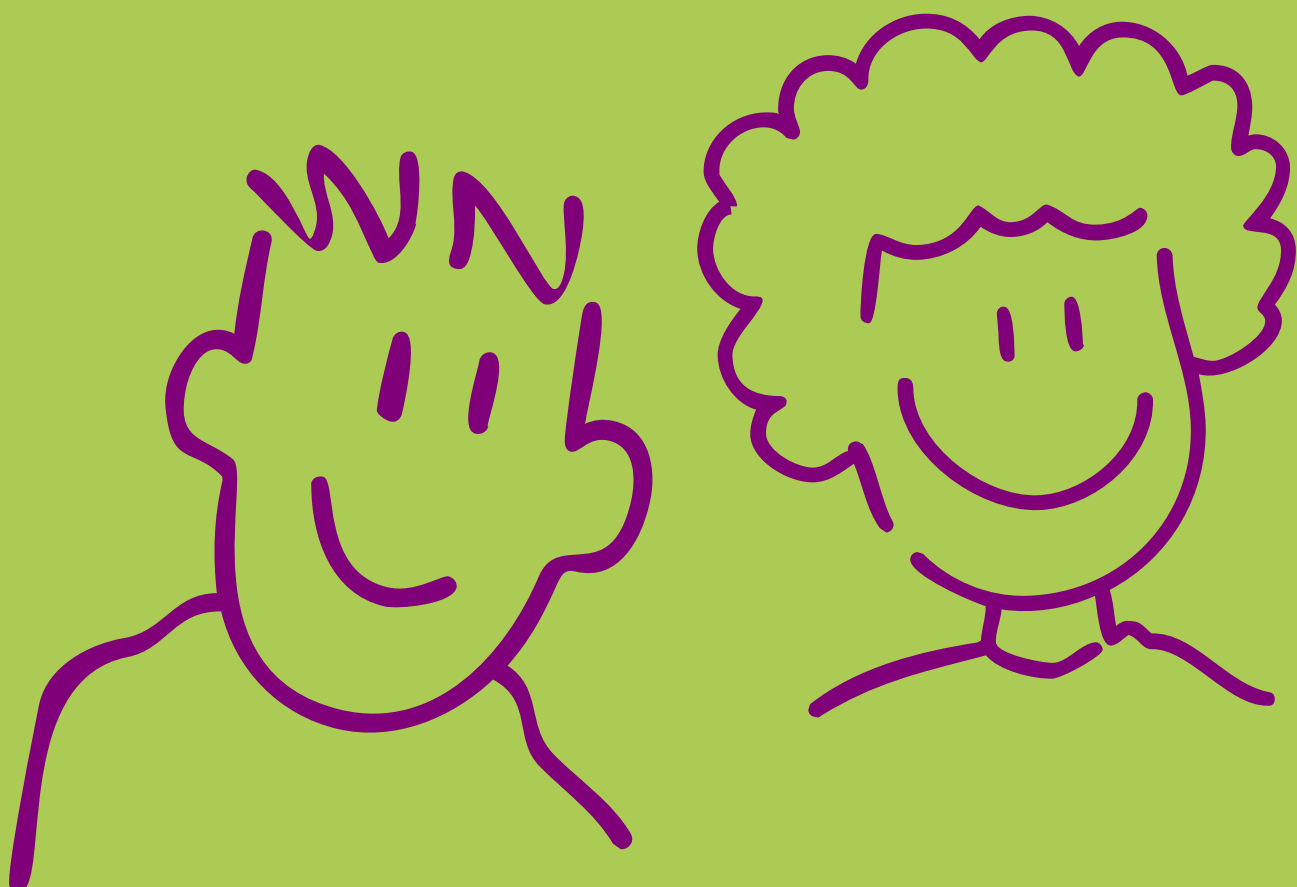
attending hospital for a range of pathological conditions. However, there were a number of surprising findings. The first was the numbers of persons studied who care for, work with or were studied due to their relationship with children. The second was the small proportion, less than 20%, of children-only studies.

There are other weaknesses inherent in this study. For example, each study paper has been assigned to a specific study type. However, a single indexing of each paper is imperfect. A more specific indexing system – indicating not simply the single nature of the study type of each paper but, where relevant, the occasion of multiple study types within a single paper – would be more discriminating. Secondly, there is a degree of subjectivity in the indexing methodology. A more rigorous, clearly defined checklist, appraising the individual factors denoted to define a study type, is required to address this weakness.

Each study group has been assigned to one of four broad population types. This approach has assisted in identifying specific population groups with regard to health-related outcomes and with regard to the nature of the population. Further stratification of these groups would aid in better understating the heterogeneous character of these groups. The general hospital population (i.e. excluding the mother–infant dyad) needs to be more clearly delineated with regard to age range and child–adult ratio. The mother–infant dyad needs further qualification to examine the frequency of pairs or single persons representing this composite. The heterogeneous clustering of health and other professionals, family groups of various composition and populations of children not from hospital or school settings also requires greater examination to allow clearer representation.



5 Conclusions



Overall conclusion

Ireland has a substantive amount of peer-reviewed published research on children. Harnessing knowledge from this research is a worthwhile aim, with much to be learned from the studied health research outcomes, the methodologies employed and the nature of the population cluster types examined. It would also assist in the very important task of translating evidence into practice, while disseminating knowledge to the interested communities.

The nature of the current research emphasizes a descriptive approach to characterising health or evaluating interventions in health. Research results present part of the picture in providing an evidence-based approach to prioritising health-related research. However, a truly evidence-based approach requires the juxtaposition of current findings against clearly identified national frameworks for health, against national frameworks in prioritising health research, and against health-information systems that allow assessment of the incidence, prevalence and current trends in health.

In general, research studies should address questions not answered by routine information systems. However, a diversity of unmapped research across an assorted array of outcomes and of a miscellaneous nature can serve to obscure what research gaps exist. The continuous mapping of 'grey' and peer-reviewed literature will both serve the research community and aid the identification of priority gaps in health-related research in these economically challenging times.

The objective of the present study was to map the nature of health research on children in Ireland, which has been accomplished. The use of internationally accepted definitions of study types and international classifications of health-related outcomes has provided a standardised coding methodology by which to view these papers. The retention of the original study authors' language, under the 23 themed, non-classifiable, health-related outcomes, allows the reader to determine alternative grouping frameworks. The study of Irish child health research shows a surprisingly diverse population group. However, this work is simply a first stage in the examination of the subject. There remain many legitimate entry points by which to further understand the nature of Irish health research on children and the part it plays in illuminating aspects of health in Ireland.

Specific conclusions

There are four main specific conclusions arising from this work – namely, the importance:

- to maintain and expand the collection and mapping of Irish child health-related research;
- to examine findings from this mapping exercise by the juxtaposition of the current research against stated national research priorities and national information databases;
- to develop a nationally accessible working framework on prioritising research into health;
- to identify the type and number of frameworks by which child health-related research is to be undertaken.

Mapping research

It would be very helpful to have a single database (or related mechanisms to support mapping) of Irish child health-related research – including both peer-reviewed and grey literature – that is maintained and updated annually. In addition to including fully referenced peer-reviewed publications, the database could accommodate the following:

- Each publication should be tagged for a range of specific characteristics. Initially, these characteristics should include study type, topic area, population type, health determinants and types of statistical analysis. Subsequent tags can be added as required.



- International classifications should be used in coding these tags. New classification systems should be added as these become more available on the Internet.
- An e-Government approach should be used to facilitate an interactive forum in which researchers can upload and tag their publications in an interactive manner. This would also facilitate the development of a peer review group to mould and develop the grouping, indexing and classifying of national research. The RICHE project is addressing the methodological issues around the development of such an approach (see Chapter 4).

Juxtapose current research against national research priorities

A range of national strategies for health exists in Ireland, including, for example, the *National Children's Strategy* (Department of Health and Children, 2000) and the *National Action Plan for Social Inclusion 2007-2016* (Office of Social Inclusion, 2007). The priorities within these strategies allow legitimate entry points in tackling health. Development of a matrix cross-referencing the areas identified by the national strategies with the areas on which research is undertaken, taking account of national information systems, would allow for a more comprehensive and dynamic picture of the actions instigated in achieving the stated national strategies' goals, as well as highlighting the remaining gaps.

Nationally accessible working framework on prioritising research into health

Priority-setting in research is complex, but a number of frameworks have been developed by which to guide this process. One WHO framework (Ranson and Bennett, 2009) includes the following guidelines:

- processes for initiating priority-setting based on the principles of legitimacy and fairness;
- general guiding principles for the application of methods and tools for health research priority-setting;
- effective follow-up of commitments and outcomes.

Again, the juxtaposition of outputs against this framework would facilitate an understanding of the picture with regard to research and potential research gaps. However, regardless of the chosen national research framework, nested child health research frameworks need to be considered within the national parameters.

Establishing a framework of child health

There exists a range of frameworks by which to structure child health research. The type, or types, of framework chosen reflects the nature of the research, economic considerations, available expertise and national and international research priorities. The epidemiological transition (i.e. the reduction of infant and childhood mortality from infectious disease) requires a greater emphasis on child health research in the areas of genetics, health technology, global migration, social and biomedical epidemiology, and public health. We are now becoming increasingly aware of the long-term consequences of the intrauterine and early childhood environment on early life development and the development of chronic diseases in later life. The foetal original hypothesis, although rather deterministic in nature, has highlighted awareness of the importance of a life course approach to understanding mental, physical and emotional health.

However, a life course approach to guiding health-related research is not the only available framework. Advances in various areas of health technology have also increased the chance of survival among previously 'at risk' infants, particularly very pre-term infants. This improvement in survival rates is coupled with increased healthcare requirements and other related factors such as educational costs. Globalisation also brings with it many changes to health priorities through cultural diversity and alterations in our disease profiles. In addition, there is substantive evidence that relative, and not absolute, levels of wealth within a country are the single greatest determinant of national health. Internationally, increased levels of violent crime, mental illness, drug addiction, illiteracy and obesity are observed among those nations that internally exhibit wide gaps between those 'who have' and those 'who have not' (Wilkinson, 2010; Siegrist, 2006; Dorling, 2010).

The research methodologies required to address health indicator cluster types differ according to the outcomes and the time point of measuring these outcomes. They also differ according to the nature of the inquiry – a clinical health perspective, a public health perspective or programmes of national equity. The European Union’s forthcoming 8th Framework Programme for Research and Technological Development (FP8) has identified a ‘life course perspective on health’ and the area of ‘inequalities’ as the main health-related foci of importance for the coming decade. This framework has many legitimate entry points through which the area of health-related research on children can be developed. The character of the framework Ireland chooses to adopt will reflect our priorities.



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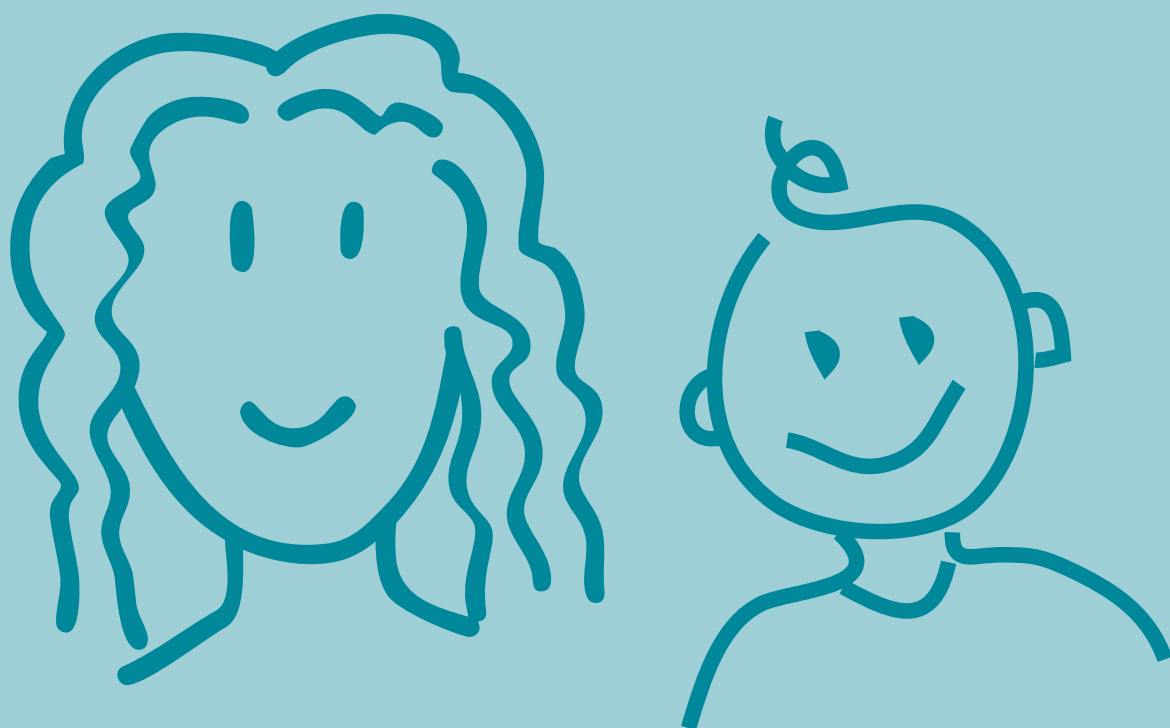
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Appendices



Appendix 1: National research groups, research groups of Ireland, the United Kingdom and European and international study groups

Association of Paediatric Anaesthetists of Great Britain and Ireland	Health Behaviours in School-aged Children (HBSC) Survey – Multinational European and North American adolescent school-based survey on health behaviours
Births Defect Research Group, Republic of Ireland	Hospital Data Project (HDP)
Autism Genetic Research Exchange Consortium (world's first collaborative gene bank for autism)	High-frequency Oscillation Study Group
Bone-anchored Hearing Aid® centres	Hvidore Study Group on Childhood Diabetes
Hospital-based centres across the United Kingdom and Ireland	International Blood and Marrow Transplant
Boyne Research Institute Study of Genetic Factors in Neural Tube Defect, Republic of Ireland	International Association for the Evaluation of Educational Achievement Pre-primary Project
British Association for Paediatric Nephrology	INFOSCAN database
British Association of Paediatric Surgeons	International Multi-centre ADHD Genetics (IMAGE) Project
British Cochlear Implant Group	International Child Care Practices Study
British Association of Perinatal Medicine	International Study of Asthma and Allergies in Childhood
British HIV Association (BHIVA)	Invasive Meningococcal Disease Database
British Ophthalmic Surveillance Unit	Irish Faculty of Paediatrics
British Paediatric and Ophthalmic Surveillance Unit	Irish Lung and Transplant Programme
British Paediatric Neurology Association	Juvenile Dermatomyositis Research Group
British Paediatric Surveillance Network of the Royal College of Paediatrics and Child Health	Irish Paediatric Surveillance Unit (established in 1996 to facilitate surveillance of uncommon paediatric disorders on the island)
British Paediatric Respiratory Society	LACE – the Study Group on Barriers and Incentives to Prenatal Care in Europe: Perinatal Care Incentives in Europe
Child Health, British Society of Gastroenterology Research Unit	Lifeways Cross Generation Cohort, Republic of Ireland
Child Health, Scottish Centre for Infection and Environmental Health	Medical Research Council, National Cancer Research Network, Childhood Leukaemia Working Party
Paediatric Register of Inflammatory Bowel Disease	MIDAC Study (Microalbuminuria in diabetic children) – study in population with insulin-treated diabetes
British Society for Antimicrobial Chemotherapy (BSAC), Bacteraemia Surveillance Programme	Multi-agency Outbreak Control Team
BSAC Bacteria Resistance Surveillance	Millennium Cohort Study
British Society for Paediatric Endocrinology and Diabetes	National Blood Users Group
Child and Adolescent Self-harm in Europe (CASE) Study	National Centre for Inherited Metabolic Disorders
Child Nutrition Panel	National Children's Food Consumption Survey
Children's Cancer and Leukaemia Group	National Teen Food Survey
Collaborative HIV Paediatric Study (CHIPS)	Irish Food Packaging Database (IFPD)
Clinical Effectiveness Group, Association of Genitourinary Medicine, Medical Society of the Study of Venereal Diseases	National Children's Food Consumption Survey
National Study of HIV in Pregnancy and Childhood	National Children's Food Survey (NCFS)
Confidential Enquiry into Maternal and Child Health	National Disease Surveillance Centre

Congenital Anomalies Register of the Department of Public Health	National Neonatal Screening Programme
EPICure Study Group (established in 1995 to determine survival and health status of children born in United Kingdom and Ireland at less than 26 weeks' gestation)	Northern Ireland Young Hearts Project (longitudinal cohort)
The EPISA study (antimicrobial susceptibility of <i>Staphylococcus aureus</i>)	PERISTAT Project: Monitoring and evaluating perinatal health
EUROCAT: European Concerted Action on Congenital Anomalies and Twins (established in 1979)	Open Study of Early Corticosteroid Treatment, Northern Ireland
Ethics Working Group of the Confederation of European Specialists in Paediatrics	Public Health Laboratory Service, Group B <i>Streptococcus</i> Working Group
EUROCOST Reference Group	Randomised Controlled Trial, Dexamethasone in Neonatal Chronic Lung Disease
EURODIAB Europe and Diabetes ACE Study Group	Respiratory Resistance Surveillance Programme
Euro-growth Longitudinal Study (designed as a multicentre longitudinal cohort study)	Royal College of Obstetricians and Gynecologists
EuroNatal Working Group	United Kingdom Transplant Support Service Authority
European Antimicrobial Resistance Surveillance System	Society for Paediatric Anaesthesia of New Zealand and Australia
EURONIC Project: Instruments and methodologies	United Kingdom and Ireland Collaborative Study of Pulmonary Atresia with Intact Ventricular Septum
European Basic Surveillance Network	United Kingdom and Ireland Medos Shunt Audit Group
European Cerebral Palsy Study	United Kingdom-based Cohen Syndrome Support Group
European Collaborative Study of Early Onset Homogeneous Bipolar Affective Disorder	United Kingdom Children Cancer Study Group and the United Kingdom Cancer Cytogenetics Group
European Influenza Surveillance Scheme	United Kingdom Collaborative Hip Trial Group
European Neuroblastoma Study Group	Paediatric Intensive Care Society Study Group
European Multi-centre Steroid Study Group	United Kingdom Paediatric Traumatic Brain Injury Study Group
European Registry for Hereditary Pancreatitis and Familial Pancreatic Cancer	Vaccine European New Integrated Collaboration Effort (VENICE) Project, Gatekeepers Group
European Resistance Surveillance System (EARSS)	Scottish Centre for Infection and Environmental Health
European Respiratory Society (ERS) Taskforce	National Prospective Tonsillectomy Audit
European Sero-epidemiology Network (ESES2)	Neonatal Intensive Care Outcomes Research and Evaluation (NICORE) Group
EUROSAVE Working Group	Neonatal Ventilation with Inhaled Nitric Oxide v. Ventilatory without Inhaled Nitric Oxide for Pre-term Infants
European Surveillance of Congenital Anomalies	Severe Respiratory Failure, INNOVO Trial Collaborating Group
French-Language Society of Paediatric Anaesthesiologists	North/South Ireland Food Consumption Survey, the National Children's Food Survey, the National Teen Food Survey
Faculty of Paediatricians in the Royal College of Physicians of Ireland	Northern Ireland Diabetes Group, Ulster Obstetrical Society
Great Britain and Ireland Paediatric Pain Services	Northern Ireland Paediatric Diabetes Study Group



Appendix 2: Peer-reviewed journals reporting published findings on health research on children in Ireland

Accident & Emergency Nursing	Journal of Antimicrobial Chemotherapy
ACOG Clinical Review	Journal AOAC [Association of Official Analytical Chemists] International
Acta Biomed	Journal of Applied Behaviour Analysis
Acta Neurologica Scandinavica	Journal of Applied Microbiology
Acta Ophthalmologica Scandinavica	Journal of Asthma
Acta Orthopaedica Belgica	Journal of Bacteriology
Acta Paediatrica	Journal of Behavior Therapy and Experimental Psychiatry
Addiction	Journal of Bone and Joint Surgery (American)
Addiction Research & Theory	Journal of Bone and Joint Surgery (British)
Adolescence	Journal of Bone and Mineral Research
Adoption & Fostering	Journal of Cardiac Surgery
Advances in Child Development and Behavior	Journal of Cardiovascular Risk
Advances in Experimental Medicine and Biology	Journal of Cataract Refract Surgery
Advances in Neonatal Care	Journal of Child Psychology and Psychiatry
Aggression & Violent Behaviour	Journal of Chromatography B: Analytical Technologies in the Biomedical and Life Sciences
Aggressive Behaviour	Journal of Clinical Endocrinology and Metabolism
AIDS	Journal of Clinical Epidemiology
AIDS & Hepatitis Digest	Journal of Clinical Microbiology
AIDS Care	Journal of Clinical Oncology
AIMS Journal	Journal of Clinical Orthodontics
AJNR American Journal of Neuroradiology	Journal of Clinical Pathology
AJR American Journal of Roentgenology	Journal of Clinical Paediatric Dentistry
Alimentary Pharmacology & Therapeutics	Journal of Clinical Rheumatology
All Ireland Journal of Nursing & Midwifery	Journal of Clinical Virology
Allergy	Journal of Control Release
American Journal of Otolaryngology	Journal of Critical Care
American Journal of Medical Genetics	Journal of Cystic Fibrosis
American Academy of Ophthalmology	Journal of Dental Education
American Educational Research Journal	Journal of Dental Research
American Journal of Epidemiology	Journal of Development and Behavioural Pediatrics
American Journal of Gastroenterology	Journal of Epidemiology and Community Health
American Journal of Clinical Nutrition	Journal of Evaluation in Clinical Practice
American Journal of Genetics	Journal of Food Protection
American Journal of Human Genetics	Journal of Forensic Legislative Medicine
American Journal of Kidney Diseases	Journal of The British Society for Surgery of the Hand
American Journal of Medical Genetics	Journal of Health Communication
American Journal of Medical Genetics, Part A	Journal of Health Economics
American Journal of Medical Genetics, Part B (Neuropsychiatric Genetics)	Journal of Health Services Research & Policy
American Journal of Medical genetics, Part C (Seminars in Medical Genetics)	Journal of Helminthology

American Journal of Medical Genetics (Neuropsychiatric Genetics)	Journal of Hospital Infection
American Journal of Nursing	Journal of Human Genetics
American Journal of Obstetrics & Gynecology	Journal of Human Lactation
American Journal of Ophthalmology	Journal of Human Nutrition and Dietetics
American Journal of Perinatology	The Journal of Immunology
American Journal of Transplantation	Journal of Infection
American Journal of Physiology: Lung Cellular and Molecular Physiology	Journal of Inherited Metabolic Disease
American Journal of Preventive Medicine	Journal of Intellectual Disabilities
American Journal of Psychiatry	Journal of Intellectual Disability Research
American Journal of Respiratory Critical Care Medicine	Journal of Interprofessional Care
American Sociological Association	Journal of Invasive Cardiology
Anaesthesia	Journal of Investigative Dermatology
Annals of Allergy Asthma Immunology	Journal of the Irish Colleges of Physicians and Surgeons
Annals of The Royal College of Surgeons of England	Journal of The Irish Dental Association
Annals of Thoracic Surgery	Journal of Laryngology & Otology
Annals of Allergy Asthma and Immunology	Journal of Maternal-Fetal and Neonatal Medicine
Annals of Clinical Biochemistry	Journal of Medical Genetics
Annals of Plastic Surgery	Journal of Microbiological Methods
Annual Review of Nursing Research	Journal of Nervous and Mental Disease
Annual Review of Sociology	Journal of Neurology, Neurosurgery & Psychiatry
Antiviral Therapy	Journal of Neurosurgery
Applied and Environmental Microbiology	Journal of Nutrition
Applied Nursing Research	Journal of Obstetrics and Gynaecology
Archives of Biochemistry and Biophysics	Journal of Adolescent Health
Archives of Environmental Health	Journal of Advanced Nursing
Archives of Ophthalmology	Journal of Allergy Clinical Immunology
Archives of Oral Biology	Journal of Antimicrobial Chemotherapy
Archives of Otolaryngology Head Neck Surgery	Journal of Applied Behavior Analysis
Archives of Pathology and Laboratory Medicine	Journal of Applied Microbiology
Archives of Paediatrics and Adolescent Medicine	Journal of Applied Research in Intellectual Disabilities
Archives of Disease in Childhood – Fetal and Neonatal Edition	Journal of Attention Disorders
Archives of Diseases in Childhood	Journal of Autism & Developmental Disorders
Archives of Orthopaedic Trauma Surgery	Journal of Beliefs & Values: Studies in Religion & Education
Archives of Pathology Laboratory Medicine	Journal of Biosocial Science
Arthritis Rheumatism	Journal of Bone and Joint Surgery – Series A
ASAIO Journal	Journal of Cataract Refractive Surgery
Assessment in Education	Journal of Child Psychology & Psychiatry
Assessment in Education: Principles, Policy & Practice	Journal of Child Psychology and Psychiatry
Association for Improvements in Maternity Services Journal	Journal of Children & Poverty
Attachment and Human Development	Journal of Children's Services
Australasian Radiology	Journal of Clinical Microbiology

Australia New Zealand & Journal of Obstetrics & Gynaecology	Journal of Clinical Endocrinology and Metabolism
Bacteriologia, virusologia, parazitologia, epidemiologia (Romanian)	Journal of Clinical Excellence
Behavioral & Brain Sciences	Journal of Clinical Immunology
Behavioral Medicine	Journal of Clinical Microbiology
Benefits: The Journal of Poverty & Social Justice	Journal of Clinical Nursing
Best Practice Research in Clinical Gastroenterology	Journal of Clinical Pathology
Best Practice Research in Clinical Obstetrics & Gastroenterology	Journal of Clinical Virology
Bioethics	Journal of Community & Applied Social Psychology
Bioethics Forum	Journal of Comparative Social Welfare
Biology of the Neonate	Journal of Computer Assisted Learning
Biologicals	Journal of Dental Education
Birth Defects Research	Journal of Dental Research
BJOG: An International Journal of Obstetrics & Gynaecology	Journal of Dentistry
British Journal of Urology International	Journal of Early Childhood Literacy
Blood	Journal of Environmental Education
Blood Cells, Molecules, and Diseases	Journal of Environmental Psychology
BMC Genomics	Journal of Ethnic & Migration Studies
BMC Health Services Research	Journal of Family History
BMC Medical Genetics	Journal of Family Issues
BMC Paediatrics	Journal of Family Practice
BMC Public Health	Journal of Gender Studies
BMC Surgery	Journal of General Virology
BMJ: British Medical Journal	Journal of Health Psychology
Bone Marrow Transplant	Journal of Hospital Infection
Brain	Journal of Human Genetics
Brain Injury	Journal of Human Hypertension
British Association of Public Health Dentistry	Journal of Immunology
British Dental Journal	Journal of Infection
British Journal of Biomedical Science	Journal of Infectious Diseases
British Journal of Cancer	Journal of Inherited Metabolic Disorders
British Journal of Dermatology	Journal of Intellectual Disabilities
British Journal Nurse	Journal of Intellectual Disability Research
British Journal of Anaesthesia	Journal of Interpersonal Violence
British Journal of Clinical Pharmacology	Journal of Interprofessional Care
British Journal of Community Nursing	Journal of Interventional Cardiology
British Journal of Criminology	Journal of Law & Society
British Journal of Developmental Psychology	Journal of Learning Disabilities
British Journal of Educational Psychology	Journal of Learning Disabilities
British Journal of General Practice	Journal of Medical Engineering & Technology
British Journal of Haematology	Journal of Medical Ethics
British Journal of Hospital Medicine	Journal of Medical Genetics
British Journal of Learning Disabilities	Journal of Medical Virology



British Journal of Medical Psychology	Journal of Microbiology
British Journal of Midwifery	Journal of Neonatal Nursing
British Journal of Neurosurgery	Journal of Neuroimmunology
British Journal of Nursing	Journal of Neurology
British Journal of Nutrition	Journal of Neurology, Neurosurgery, Psychiatry
British Journal of Ophthalmology	Journal of Nursing Management
British Journal of Plastic Surgery	Journal of Obstetrics & Gynaecology
British Journal of Psychiatry	Journal of Oral Rehabilitation
British Journal of Social Psychology	Journal of Orthodontics
British Journal of Social Work	Journal of Orthopaedic Nursing
British Journal of Sociology of Education	Journal of Paediatric Neurology
British Journal of Special Education	Journal of Paediatric Surgery
British Journal of Sports Medicine	Journal of Paediatric Nursing
British Journal of Surgery	Journal of Paediatric Urology
British Journal of Urology	Journal of Perinatal Medicine
British Journal of Oral and Maxillofacial Surgery	Journal of Personality Assessment
British Journal of Sociology	Journal of Plastic, Reconstructive & Aesthetic Surgery
Bulletin of the WHO	Journal of Precision Teaching & Celeration
Burns	Journal of Psychiatric and Mental Health Nursing
Cambridge Journal of Education	Journal of Research in Special Educational Needs
Canadian Journal of Cardiology	Journal of Science & Medicine in Sport
Canadian Journal of Anaesthesiology	Journal of Sexual Aggression
Cancer Genetics and Cytogenetics	Journal of Social History
Carcinogenesis	Journal of Social Issues
Cardiology in the Young	Journal of Social Policy
Caries Research	Journal of Social Psychology
Catheterisation & Cardiovascular Interventions	Journal of Social Welfare & Family Law
Cellular Microbiology	Journal of Social Work
Child & Adolescent Mental Health	Journal of Social Work Practice
Child & Family Law Quarterly	Journal of Social Work Practice in the Addictions
Child & Family Social Work	Journal of Social Work Research and Evaluation
Child & Youth Care Forum	Journal of Sport & Social Issues
Child & Youth Services	Journal of Substance Abuse Treatment
Child Abuse & Neglect	Journal of Substance Use
Child Abuse Review	Journal of Systemic Therapies
Child and Adolescent Mental Health	Journal of The American College of Cardiology
Child Care in Practice	Journal of The American Academy of Child & Adolescent Psychiatry
Child Maltreatment	Journal of The American Association for Paediatric Ophthalmology & Strabismus
Child Psychology & Psychiatry Review	Journal of The American Heart Association
Child Welfare	Journal of The Canadian Dental Association
Child: Care, Health & Development	Journal of the History of Sexuality
Childhood	Journal of The International Association of Physicians in AIDS Care
Childhood: A Global Journal of Child Research	Journal of Thoracic and Cardiovascular Surgery

Children & Society	Journal of Trauma & Dissociation
Children & Young People Now	Journal of Urban History
Children & Youth Services Review	Journal of Urology
Child's Nervous System	Journal of Virological Methods
Chinese Journal of Contemporary Paediatrics	Journal of Virology
Circulation	Journal of Wound Care
Cleft Palate Craniofacial Journal	Journal of Youth and Adolescence
Clinical Biomechanics	Journal of Youth Studies
Clinical Chemistry	Journal of Oral and Maxillofacial Surgery
Clinical Endocrinology	Journal of Oral Pathology Medicine
Clinical Evidence	Journal of Orthodontics
Clinical Linguistics Phonetics	Journal of Paediatrics
Clinical Otolaryngology	Journal of Paediatric Endocrinology and Metabolism
Clinical Otolaryngology and Allied Sciences	Journal of Paediatric Gastroenterology and Nutrition
Clinical Radiology	Journal of Paediatric Hematology Oncology
Clinical & Experimental Allergy	Journal of Paediatric Nursing
Clinical & Experimental Immunology	Journal of Paediatric Ophthalmology and Strabismus
Clinical & Experimental Rheumatology	Journal of Paediatric Orthopaedics
Clinical Child Psychology & Psychiatry	Journal of Pediatric Orthopaedics, Part B
Clinical Dysmorphology	Journal of Paediatric Psychology
Clinical Experimental Dermatology	Journal of Paediatric Surgery
Clinical Gastroenterology and Hepatology	Journal of Perinatal Medicine
Clinical Genetics	Journal of Perinatology
Clinical Infectious Diseases	Journal of Pharmaceutical and Biomedical Analysis
Clinical Laboratory Haematology	Journal of Pharmacy and Pharmacology
Clinical Microbiology & Infection	Journal of Proteome Research
Clinical Neurophysiology	Journal of Psychiatric and Mental Health Nursing
Clinical Neurology & Neurosurgery	Journal of Psychiatric Research
Clinical Nutrition	Journal of Public Health
Clinical Otolaryngology	Journal of Public Health Medicine
Clinical Paediatrics	Journal of the Royal Society for the Promotion of Health
Clinical Radiology	Journal of Radiological Protection
Clinical Rehabilitation	Journal of Reproductive Medicine
Clinical Science	Journal of Spinal Disorders and Techniques
Clinical Transplantation	Journal of Surgical Orthopaedic Advances
Clinics in Dermatology	Journal of Surgical Research
Clinics in Liver Disease	Journal of Telemedicine and Telecare
Cochlear Implants International	Journal of Thoracic and Cardiovascular Surgery
Cochrane Database Systematic Review	Journal of Trauma
Cognitive & Behavioural Practice	Journal of Ultrasound Medicine
Collegium Antropologicum	Journal of Vascular and Interventional Radiology
Colorectal Disease	Kidney International
Communicable Disease and Public Health	Lancet Infectious Diseases
Community Care	Lancet Neurology
Community Dental Health	Language and Speech

Community Dentistry & Oral Epidemiology	Language & Intercultural Communication
Community Practitioner	Language and Education
Community Safety Journal	Laryngoscope
Community, Work & Family	Laterality
Comparative Education	Leukemia
Computer Methods: Biomechanics and Biomedical Engineering	Literacy
Computational Statistics & Data Analysis	Logopedics Phoniatrics Vocology (Norwegian)
Computer Fraud & Security	Lung Cancer
Conference Proceedings of the IEEE Engineering in Medicine and Biology Society	Mammalian Genome
Conference Papers – American Sociological Association	Maternal Child Nutrition
Conference Papers – Law & Society	MCN: American Journal of Maternal and Child Nursing
Conference Papers of the American Sociological Association	Medical and Biological Engineering and Computing
Conflict Resolution Quarterly	Medical Education
Congenital Heart Disease	Medical Image Analysis
Contact Dermatitis	Medicine and the Law
CornerStone	Medicine, Science and the Law
Cortex	Medicine and Science in Sports and Exercise
Counselling Psychology Review	Medical Letter on the CDC & FDA
Crime, Media, Culture	Mental Health Nursing
Criminal Behaviour & Mental Health	Mental Health Practice
Criminal Law & Criminology	Mental Health, Religion & Culture
Critical Care	Mental Retardation and Developmental Disabilities Research Reviews
Critical Social Policy	Methods in Molecular Biology
Critique of Anthropology	Methods in Molecular Medicine
Cultural Dynamics	Microbial Ecology in Health and Disease
Current Treat Options in Gastroenterology	Microbiology
Current Allergy and Asthma Reports	Midwifery
Current Gastroenterology Reports	Midwifery Today
Current Infectious Disease Reports	Midwifery Today with International Midwife
Current Issues in Criminal Justice	Midwives
Current Issues in Molecular Biology	Minerva Pediatrica
Current Medicinal Chemistry	Molecular and Cellular Probes
Current Opinion in Critical Care	Molecular Psychiatry
Current Opinion in Gastroenterology	Molecular Vision
Current Opinion in Investigational Drugs	Molecular Genetics and Metabolism
Current Opinion in Paediatrics	Mortality
Current Opinion in Psychiatry	Movement Disorders
Current Opinion in Urology	Multiple Sclerosis
Current Opinion in Obstetrics and Gynecology	Multicultural Review
Current Treatment Options in Gastroenterology	Mutation Research
Cyber Psychology & Behaviour	Mycoses
Cytogenetics and Cell Genetics	Naturwissenschaften

Cytogenetics Genome Research	Neonatology
Death Studies	Nephrology Dialysis Transplantation
Dental Traumatology	Neuropsychological Rehabilitation
Dental Update	Neuroendocrinology Letters
Developmental Psychology	Neurology
Developmental Review	Neuronal Hypertrophy in Acute Appendicitis
Development	Neuropaediatrics
Developmental Disabilities Research Reviews	Neuropharmacology
Developmental Medicine & Child Neurology	Neuropsychologia
Developmental Neurorehabilitation	Neuropsychopharmacology
Deviant Behaviour	Neuroreport
Diabetic Medicine	Neuroscience Letters
Diabetes	Neurosurgery
Diabetes Care	Neurourology and Urodynamics
Diabetes Metabolic Research Review	New Directions for Youth Development
Diabetologia	New England Journal of Medicine
Digestive and Liver Disease	Novartis Foundation Symposium
Diseases of the Colon and Rectum	Nurse Education in Practice
Disability & Rehabilitation	Nursing & Health Sciences
Disability & Society	Nursing History Review
Drug and Alcohol Dependence	Nursing in the Community
Drug Safety	Nursing Standard
Drugs	Nursing Times
Drugs: Education, Prevention & Policy	Nutrition Reviews
Dyslexia	Obstetrics and Gynecology
Ear, Nose & Throat Journal	Occupation and Environmental Medicine
Early Child Development & Care	Occupational Therapy International
Early Childhood Research Quarterly	Ocular Surgery News
Early Education & Development	Omega: Journal of Death & Dying
Early Human Development	Oncologist
Early Years: An International Journal of Research and Development	Ophthalmic and Physiological Optics
Education & Training	Ophthalmic Epidemiology
Educational & Treatment of Children	Ophthalmic and Physiological Optics
Educational and Child Psychology	Ophthalmology Clinics of North America
Educational Psychology	Optometry and Vision Science
Educational Psychology in Practice	Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology and Endodontology
Educational Studies	Otology and Neurotology
Emergency Medical Journal	Otolaryngology Head and Neck Surgery
Emergency Nurse	Pace
Emerging infectious Diseases	Paediatric Anaesthesia
Emotional & Behavioural Difficulties	Paediatric Drugs
Endodontics & Dental Traumatology	Paediatric and Perinatal Epidemiology
Environmental Health Perspectives	Paediatric Respiratory Reviews
Environmental Impact Assessment Review	Paediatric Nursing

Epidemiology & Infection	Palliative Medicine
Epilepsia	Parasitology
Ergonomics	Pastoral Care in Education
Ethics and Social Welfare	Pathophysiology of Haemostasis and Thrombosis
Ethnic & Racial Studies	Patterns of Prejudice
European Addiction Research	Peace & Conflict
European Archives of Paediatric Dentistry	Peace and Conflict: Journal of Peace Psychology
European Eating Disorders Review	Paediatric Allergy Immunology
European Heart Journal	Paediatric Cardiology
European Journal of Anaesthesiology	Paediatric Critical Care Medicine
European Journal of Biochemistry	Paediatric Dentistry
European Journal of Cancer	Pediatric Dermatology
European Journal of Clinical Microbiology and Infectious Disease	Pediatric and Development Pathology
European Journal of Dental Education	Paediatric Diabetes
European Journal of Echocardiography	Paediatric Emergency Care
European Journal of Emergency Medicine	Paediatric Endocrinology Reviews
European Journal of Epidemiology	Paediatric Infectious Disease Journal
European Journal of Gastroenterology and Hepatology	Paediatric International
European Journal of Health Economics	Paediatric Nephrology
European Journal of Nutrition	Pediatric Pulmonology
European Journal of Obstetrics and Gynecology and Reproductive Biology	Pediatric Pulmonology Supplement
European Journal of Anaesthesiology	Paediatric Surgery International
European Journal of Cancer Care	Paediatric Transplant
European Journal of Cardiothoracic Surgery	Paediatric Anesthesia
European Journal of Child & Adolescent Psychiatry	Paediatric Blood Cancer
European Journal of Clinical Nutrition	Paediatric Cardiology
European Journal of Contraception & Reproductive Health Care	Paediatric Dermatology
European Journal of Crime, Criminal Law & Criminal Justice	Paediatric Diabetes
European Journal of Emergency Medicine	Paediatric Drugs
European Journal of General Practice	Paediatric Endosurgery and Innovative Techniques
European Journal of Health Law	Paediatric Hematology & Oncology
European Journal of Human Genetics	Paediatric Nephrology
European Journal of Migration & Law	Paediatric Neurology
European Journal of Oncology Nursing	Paediatric Pulmonology
European Journal of Orthodontics	Paediatric Radiology
European Journal of Paediatric Dentistry	Paediatric Rehabilitation
European Journal of Paediatrics	Paediatric Research
European Journal of Public Health	Paediatric Surgery International
European Journal of Radiology	Paediatric Transplant
European Journal of Social Work	Paediatrics
European Journal of Special Needs Education	Perceptual and Motor Skills
European Journal of Vascular and Endovascular Surgery	Perfusion

European Journal of Ophthalmology	Personality & Individual Differences
European Journal of Paediatric Neurology	Pharmacogenomics
European Journal of Paediatric Surgery	Physical & Occupational Therapy in Pediatrics
European Journal of Prosthodontics and Restorative Dentistry	Physical Therapy Reviews
European Journal of Public Health	Plastic Reconstructive Surgery
European Journal of Surgery	Population Trends
European Paediatric of Neurology Society	Postgraduate Medical Journal
European Radiology	The Practising Midwife
European Respiratory Journal	Practical Diabetes International
European Sociological Review	Practice
European Spine Journal	Practice Nurse
European Urology	Practising Midwife
Eurosurveillance	Prenatal Diagnosis
Evidence-based Nursing	Primary Dental Care
Experimental Brain Research	Proceedings of The National Academy of Science, USA
Experimental and Molecular Pathology	Proceedings of The Nutrition Society
Expert Opinion on Pharmacotherapy	Professional Nurse
Eye	Prosthetics and Orthotics International
Facial Plastic Surgery	PsycCRITIQUES
Family Advocate	Psychiatric Genetics
Family Law Quarterly	Psychiatric Bulletin
Family Matters	Psychological reports
Family Practice	Psychological Record
Feminist Review	Psychology, Crime & Law
Feminism & Psychology	Public Administration
FEMS Immunology and Medical Microbiology	Public Finance
FEMS Microbiology Ecology	Public Health
Fertility Sterility	Public Health Nutrition
Fetal Diagnosis and Therapy	Public Health Reports
Focus on Alternative & Complementary Therapies	Quarterly Journal of Experimental Psychology
Folia phoniatica et logopaedica: Official Organ of the International Association of Logopedics and Phoniatics	Quarterly Journal of Medicine: An International Journal of Medicine
Food Additives and Contaminants	Quality and Safety in Health Care
Food and Nutrition Bulletin	Qualitative Research
Forum: Qualitative Social Research	Qualitative Health Research
Fungal Genetic and Biology	Quality of Life Research
Gait and Posture	Race, Ethnicity & Education
Gastroenterology	Radiation Protection Dosimetry
Gender & Education	Radical History Review
Genes & Immunity	Radiography
Genetic Testing and Molecular Biomarkers	RCM Midwives
Genetic Epidemiology	RCM Midwives Journal
Graefe's Archive for Clinical and Experimental Ophthalmology (Albrecht von Graefes Archiv für klinische und experimentelle Ophthalmologie)	ReCALL: Journal of EuroCall

Group Analysis	Recherches sociologiques et anthropologiques
Gut	Renal Failure
Haemophilia	Reproductive Health
Hand Surgery	Research in Developmental Disabilities
Health & Social Care in the Community	Research on Social Work Practice
Health Care Management Science	Respiratory Medicine
Health Education	Resuscitation
Health Education Research	Revue de laryngologie – otologie – rhinologie
Health Policy	Annual Review of Neuroscience
Health Promotion International	Revista portuguesa de cardiologia: Órgão oficial da Sociedade Portuguesa de Cardiologia (Portuguese Journal of Cardiology: An Official Journal of the Portuguese Society of Cardiology)
Health Statistics Quarterly	Rheumatology
Heart	Rheumatology
Haematologica (Italian)	Scandinavian Journal of Occupational Therapy
Hepatogastroenterology	Scandinavian Journal of Primary Health Care
Higher Education Quarterly	Schizophrenia Bulletin
History of Education	Schizophrenia Research
HIV Medicine	Scottish Journal of Political Economy
Homeostasis in Health and Disease	Seizure
Hospital Medicine	Seminars in Hematology
Human and Experimental Toxicology	Seminars in Neonatology
Human Fertility	Seminars in Fetal & Neonatal Medicine
Human Mutation	Seminars in Paediatric Infectious Diseases
Human Psychopharmacology	Seminars in Paediatric Surgery
Human Reproduction	Sex Roles
Human Immunology	Sexualities
Human Pathology	Singapore Dental Journal
Human Rights Quarterly	Skeletal Radiology
Human Vaccines	Sleep
IEEE Transactions on Biomedical Engineering	Social Science & Medicine
IFE Psychologia: An International Journal	Social work in Health Care
Immunoematology	Social Analysis
Infant & Child Development	Social Development
Infection & Immunity	Social Indicators Research
Injury	Social Policy & Administration
Injury Prevention	Social Psychiatry and Psychiatric Epidemiology
International Dental Journal	Social Science & Medicine
International Ophthalmology	Social Work and Social Sciences Review
Intensive Care Medicine	Social Work Education
Interactive Cardiovascular and Thoracic Surgery	Sociological Origins
International Immunology	Sociological Studies of Children & Youth
International Journal of Antimicrobial Agents	Sociology
International Journal of Behavioural Nutrition and Physical Activity	Sociology of Crime, Law & Deviance

International Journal of Clinical Practice	Special Care in Dentistry
International Journal of Development Biology	Spinal Cord
International Journal of Drug Policy	Spine
International Journal of Emergency and Mental Health	Sports Biomechanics
International Journal of Food Microbiology	Sports Medicine
International Journal of Food Science and Nutrition	Statistics in medicine
International Journal of Language and Communication Disorders	Studies in Health Technology Information
International Journal of Nursing Studies	Suicide & Life –Threatening Behaviour
International Journal of Obesity	Support for Learning
International Journal of Obesity and Related Metabolic Disorders	Surgical Infections
International Journal of Obstetric Anesthesia	Surgical Neurology
International Journal of Adolescent Medicine and Health	Surgical and Radiologic Anatomy
International Journal of Behavioral Development	Surgeon
International Journal of Bilingual Education & Bilingualism	Teachers College Record
International Journal of Children’s Rights	The American Journal of Orthopedics
International Journal of Consumer Studies	The Association for Family Therapy & Systemic Practice
International Journal of Disability, Development & Education	The British Association of Plastic Surgeons
International Journal of Diversity in Organisations, Communities & Nations	The British Journal of Radiology
International Journal of Drug Policy	The Canadian Journal of Gastroenterology
International Journal of Early Years Education	The Elementary School Journal
International Journal of Epidemiology	The FASEB Journal : Official Publication of the Federation of American Societies for Experimental Biology
International Journal of Health Care Quality Assurance incorporating Leadership in Health Services	The History of the Family
International Journal of Health Promotion & Education	The International Journal of Children’s Rights
International Journal of Inclusive Education	The International Society for Microbial Ecology Journal
International Journal of Infectious Diseases	The Journal of Alternative & Complementary Medicine
International Journal of Injury Control & Safety Promotion	The Journal of Bone & Joint Surgery
International Journal of Law, Policy & the Family	The Journal of Infectious Diseases
International Journal of Mental Health Promotion	The Journal of Laryngology & Otology
International Journal of Nursing Practice	The Journal of Neuroscience
International Journal of Nursing Studies	The Journal of Neurosurgery
International Journal of Obesity	The Journal of Paediatrics
International Journal of Oral Maxillofacial Surgery	The Journal of The American Academy of Psychiatry & the Law
International Journal of Paediatric Dentistry	The Journal of The Society for the Anthropology of Europe
International Journal of Paediatric Otorhinolaryngology	The Lancet
International Journal of Reality Therapy	The Psychologist
International Journal of Social Welfare	The Society of Thoracic Surgeons
International Journal of STD & AIDS	Theory & Psychology
International Journal of the Care of the Injured	Theory Into Practice
International Journal of the Sociology of Law	Therapy Today

International Journal of Paediatric Dentistry	Thorax
International Journal of Palliative Nursing	Thrombosis and Haemostasis
International Journal of Paediatric Obesity	Thrombosis Research
International Journal of Paediatric Otorhinolaryngology	Thyroid
International Journal of Pharmaceutics	Transfusion
International Journal of Sports Medicine	Transfusion Medicine
International Journal of Technology Assessment in Health Care	Transplant International
International Journal of Vitamin and Nutritional Research	Transplant Proceedings
International Orthopaedics	Transplantation
International Social Work	Treatments in Respiratory Medicine
International Studies in Sociology of Education	Trends in Microbiology
Interventions: The International Journal of Postcolonial Studies	Tuberculosis
Investigative Ophthalmology & Visual Science	Ulster Medical Journal
Irish Journal of Medical Science	Ultrasound in Obstetrics & Gynecology : The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology
Irish Journal of Psychological Medicine	Urology
Irish Journal of Psychology	Vaccine
Irish Journal of Sociology	Value Health
Irish Medical Journal	Vector-borne Zoonotic Disease
Irish Studies Review	Vulnerable Children & Youth Studies
Issues in Comprehensive Paediatric Nursing	Women's Studies
The Journal of the American Medical Association (JAMA)	Women's Studies International Forum
JBR-BTR: Organe de la Société Royale Belge de Radiologie (SRBR) (Orgaan van de Koninklijke Belgische Vereniging voor Radiologie)	World Journal of Gastroenterology
Journal of Acquired Immune Deficiency Syndromes	World Journal of Surgery
Journal of Adolescence	World of Irish Nursing
Journal of Advanced Nursing	World of Irish Nursing & Midwifery
Journal of the American Academy of Child Adolescent Psychiatry	Youth & Policy
Journal of the American Academy of Dermatology	Youth & Society
Journal of the American Podiatric Medical Association	Youth Justice
Journal of the American Society of Nephrology	Zoonoses Public Health
Journal of Anatomy	
Journal of Animal Science	





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