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Causes and temporal changes in nationally collected stillbirth audit data in high-resource settings

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A B S T R A C T

Few high-income countries have an active national programme of stillbirth audit. From the three national programmes identified (UK, New Zealand, and the Netherlands) steady declines in annual stillbirth rates have been observed over the audit period between 1993 and 2014. Unexplained stillbirth remains the largest group in the classification of stillbirths, with a decline in intrapartum-related stillbirths, which could represent improvements in intrapartum care. All three national audits of stillbirths suggest that up to half of all reviewed stillbirths have elements of care that failed to follow standards and guidance. Variation in the classification of stillbirth, cause of death and frequency of risk factor groups limit our ability to draw meaningful conclusions as to the true scale of the burden and the changing epidemiology of stillbirths in high-income countries. International standardization of these would facilitate direct comparisons between countries. The observed declines in stillbirth rates over the period of perinatal audit, a possible consequence of recommendations for improved antenatal care, should serve to incentivise other countries to implement similar audit programmes.

1. Introduction

Stillbirth is a global problem, and whereas the vast majority (98%) of stillbirths occur in low- and middle-income countries [1], stillbirth remains an issue for high-income countries (HICs) with rates declining in some countries and remaining fairly static or even increasing in others [2]. In order to achieve the ambition set out in the recent *Lancet* series to end preventable stillbirths, national initiatives need to be established and implemented.

Although the stillbirth and neonatal mortality rates in some HICs appear relatively high in relation to their peers, the lack of detail available about these deaths, in most countries, limits our understanding of both the scale of the true difference and also what we might learn from other countries. Findings from focus groups with professional and parent organisations in the UK Stillbirth Priority Setting Partnership identified 11 research priorities necessary for addressing the prevention of still birth, including the contribution of lifestyle factors to the stillbirth risk and investigating why the stillbirth incidence in the UK is higher than that of other HICs [3]. Furthermore, monitoring the impact of initiatives internationally is compromised by the use of different definitions of mortality rates between countries, with the threshold for inclusion in routine national statistics varying from 20^{+0} to 28^{+0} weeks of gestational age.

In this article, stillbirth rates over recent years are reviewed together with changes in the classification of the cause of death of stillbirths. Data from national perinatal audits in HICs will be used to describe the changing epidemiology of stillbirth in order to try to identify potential strategies for the reduction in stillbirths.

2. Trends in stillbirth rates in high-income countries

International comparisons of stillbirth rates are complex due to the lack of a common definition of stillbirth in terms of the lowest gestational age (ranging from 20 to 28 weeks) and/or birthweight cut-off (400–1000 g) included and reporting issues even within HICs. Standardizing to the World Health Organization (WHO) stillbirth definition of ≥28 weeks of gestation in 2015, HICs showed wide variation [4], with rates for stillbirths ranging from 1.3 to 8.8

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per 1000 total births, with similar levels of variation in the annual rate of reduction (ARR) for stillbirths from a small increase of 0.5% to a reduction of 6.8% over the period 2000 to 2015.

However, despite the problems with direct international comparisons, aggregating data from HICs using the same definitions (gestational age and/or birthweight criteria) provides information about trends over time for each defined group, although not direct comparison of the absolute rates (Figs. 1 and 2). The trend for stillbirth in HICs over the past 20 years shows a small decrease, although there are variations between countries. In Australia and New Zealand, where the stillbirth rate includes outcomes from 20 weeks of gestational age, there has been little change over this period, whereas an overall decline can be seen in most countries using a 22/24 week or 28-week definition of stillbirth. In both birthweight inclusion groups there has been a decline in the stillbirth rate over time apart from in the Czech Republic, where the rate has increased from 3.11 per 1000 births in 1995 to 3.58 per 1000 births in 2015.

3. National audit of stillbirths

The widely accepted definition of perinatal audit is “the systematic, critical analysis of the quality of perinatal care, including the procedures used for diagnosis and treatment, the use of resources and the resultant outcome and quality of life for women and their babies” [5]. To date, few HICs have instigated a national system of stillbirth audit as identified in the recent *Lancet* stillbirth series [4]. Updating their search strategy, we checked whether additional programmes had been established or whether there had been further developments since publication in 2016. This search confirmed that there are currently national perinatal audit programmes in only three HICs: New Zealand, the UK, and the Netherlands. Ireland has established national perinatal data collection but does not, as yet, carry out confidential enquiries or other in-depth case reviews, although it has recommended that a formal system of national confidential enquiries for stillbirth be established [6]. National perinatal audit was carried out from 1984 in Norway but has now been terminated at a national level despite being associated with a substantial decrease in the perinatal mortality rate (13.8–7.7 per 1000 live births) over its period of use [7].

Stillbirth proportions and rates are presented. The statistical significance of any trends was investigated using the Cochran Armitage test and Spearman's test for correlation, respectively, in Stata/IC (v14).

4. Cause and temporal trends in stillbirths from current national audits

4.1. New Zealand

The Perinatal and Maternal Mortality Review Committee (PMMRC) was established in New Zealand in 2006 with the primary aim of reducing the number of preventable perinatal and maternal deaths. This programme reviews all stillbirths following a

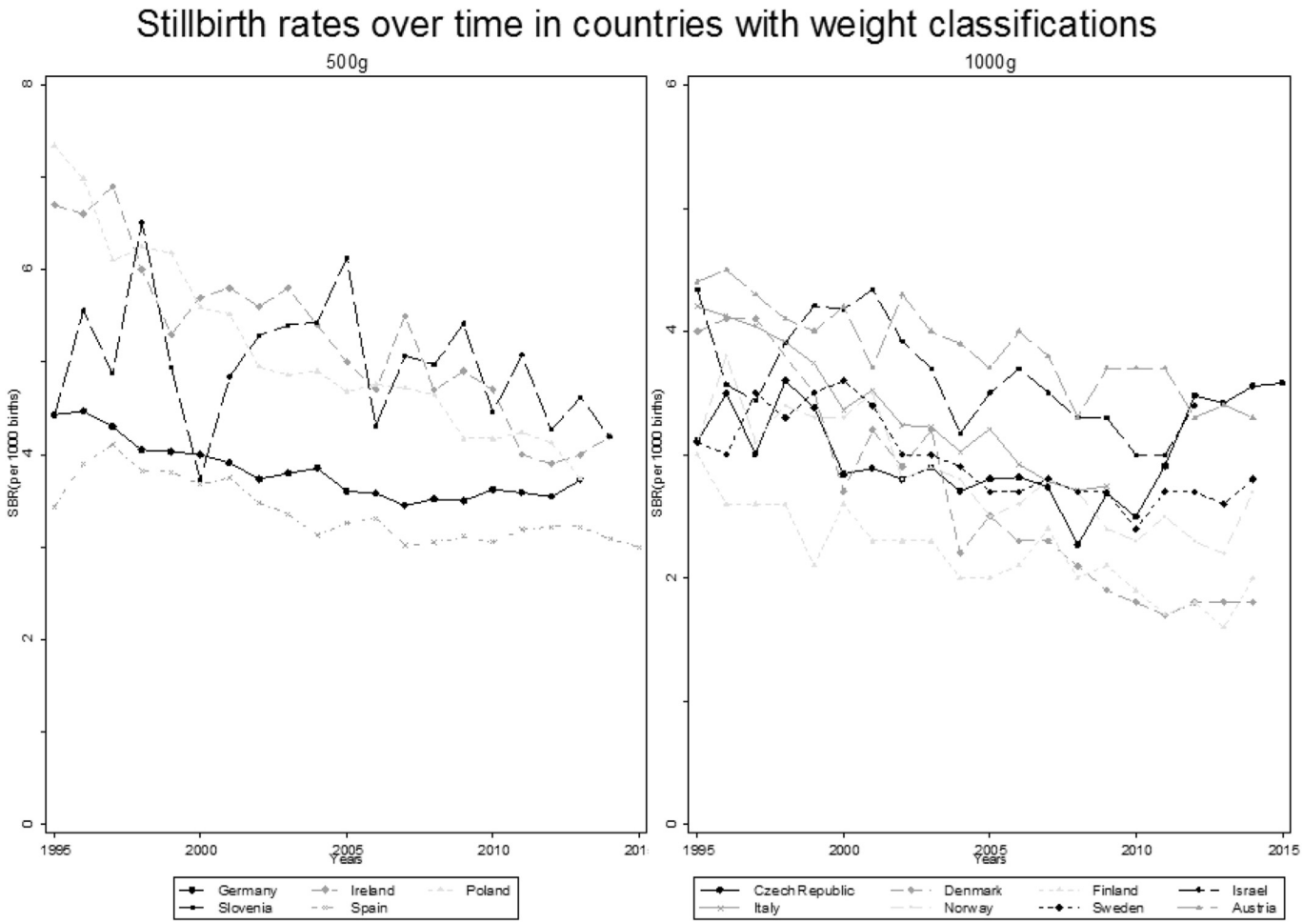

Fig. 1. Stillbirth rates (SBR) over time in countries with weight classifications.

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