International Journal of Gynecology and Obstetrics 127 (2014) 243–247

Contents lists available at ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo

CLINICAL ARTICLE

Preterm birth and neonatal mortality in China in 2011

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ARTICLE INFO

Article history:
Received 25 December 2013
Received in revised form 9 June 2014
Accepted 29 July 2014

Keywords:
Mode of delivery
Neonatal mortality
Preterm birth

ABSTRACT

Objective: To determine the incidence of preterm birth, its regional distribution, and associated neonatal mortality in mainland China. *Methods:* In a multicenter, hospital-based investigation of preterm birth, 2011 data were obtained from the seven administrative regions of mainland China. Between one and three subcenters were randomly selected for each administrative region, followed by secondary and tertiary hospitals within the chosen subcenters. Data were obtained from women's medical records, and obstetric and perinatal events were summarized. *Results:* Data for 107 905 deliveries were analyzed, which included 7769 (7.1%) preterm births (occurring between 28 and 37 weeks of pregnancy). The incidence varied among regions. Late preterm birth (between 34 and 37 weeks) accounted for 5495 (70.7%) of preterm births. The neonatal mortality rate was 33 deaths per 1000 live preterm births. Of the 254 neonatal deaths, 147 (57.9%) occurred after very preterm birth (between 28 and 32 weeks). Overall, 4519 (58.2%) preterm births occurred by cesarean. *Conclusion:* The distribution of preterm birth across China is unbalanced, and neonatal mortality associated with preterm birth is high.

1. Introduction

Preterm birth was defined by a WHO expert committee in 1969 as a birth before 37 weeks (<259 days) of pregnancy (calculated from the first day of the last menstrual period) [1]. By contrast, the lower boundary has not been defined, and can vary from 20 weeks to 28 weeks according to country [1–4]. On the basis of neonatal survival, long-term consequences, and socioeconomic factors, the lower boundary of preterm birth in China is considered to be 28 completed weeks of pregnancy (≥196 days).

As the leading cause of perinatal mortality, preterm birth is a key issue in obstetrics and pediatrics worldwide [5–7]. Preterm birth can also have a long-term impact on neurodevelopmental functioning in the newborn; for example, it increases the risk of cerebral palsy, impaired learning, visual disorders, and chronic disease in adulthood [2,7,8]. The neonatal intensive care and subsequent healthcare and educational needs of infants born preterm incur a high economic cost [2,7]. There is also a social cost for families affected by preterm birth. Many countries are still far away from achieving the goal of a two-thirds reduction in the incidence of preterm birth and low birth weight that was set in the UN's fourth Millennium Development Goal [9,10].

The mortality rate of newborns born preterm differs among countries and relates to economic development [7,10]. Whereas more than 90% of neonates born before 28 weeks' gestation survive in high-resource countries, 10% at most survive in low-resource settings [7].

China is a large country in which socioeconomic development varies considerably by region. The incidence of preterm birth and perinatal outcomes also differ. There are no national data on preterm birth, its regional distribution, associated mode of delivery, and neonatal mortality. The aim of the present study was therefore to describe the incidence of preterm birth, its distribution, and associated neonatal mortality in mainland China.

2. Materials and methods

In a national, multicenter, hospital-based investigation, data on preterm deliveries were collected from hospitals that had been randomly selected via a stratified multistage cluster sampling design. All participating hospitals signed the study and data-use agreement and provided all relevant data from 2011. Because there was no identifiable information in the data set, informed consent was not needed. The study was approved by the Beijing Obstetrics and Gynecology Hospital Ethical Review Board.

There are seven administrative regions in mainland China excluding Hong Kong and Macau—Northeast China, North China, East China, Central China, South China, Southwest China, and Northwest China—which each contain between three and seven provinces, municipal cities, or autonomous regions (hereafter, subcenters). For each administrative region, one or two subcenters were randomly selected, with a probability of selection proportional to population size. Two subcenters were selected for administrative regions with more than five provinces or municipal cities. A total of 11 subcenters were selected: Beijing and Inner Mongolia in North China, Shanghai and Jiangsu in East China, Shaanxi and Xinjiang in Northwest China, Liaoning and

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http://dx.doi.org/10.1016/j.ijgo.2014.06.018
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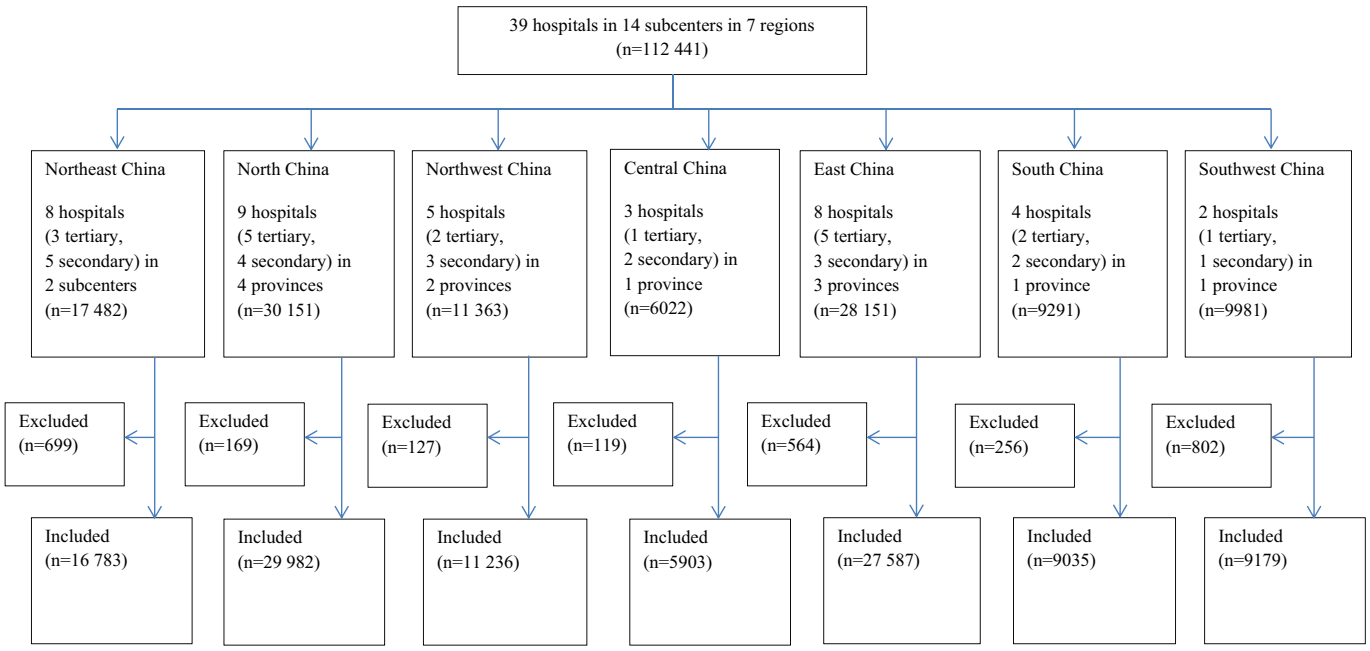

Fig. 1. Study profile.

Jilin in Northeast China, Hubei in Central China, Sichuan in Southwest China, and Guangdong in South China.

For each participating subcenter, one tertiary hospital and two secondary hospitals were randomly selected by computer, with a probability of selection proportional to hospital size. If one of the three hospitals had fewer than 3000 deliveries in 2011, another hospital of the same level was selected from the same subcenter. In China, primary hospitals are not authorized to perform prenatal screening (e.g. screening for Down syndrome) and cesarean deliveries, and do not manage high-risk pregnancies; thus, there is no obstetrics department in most

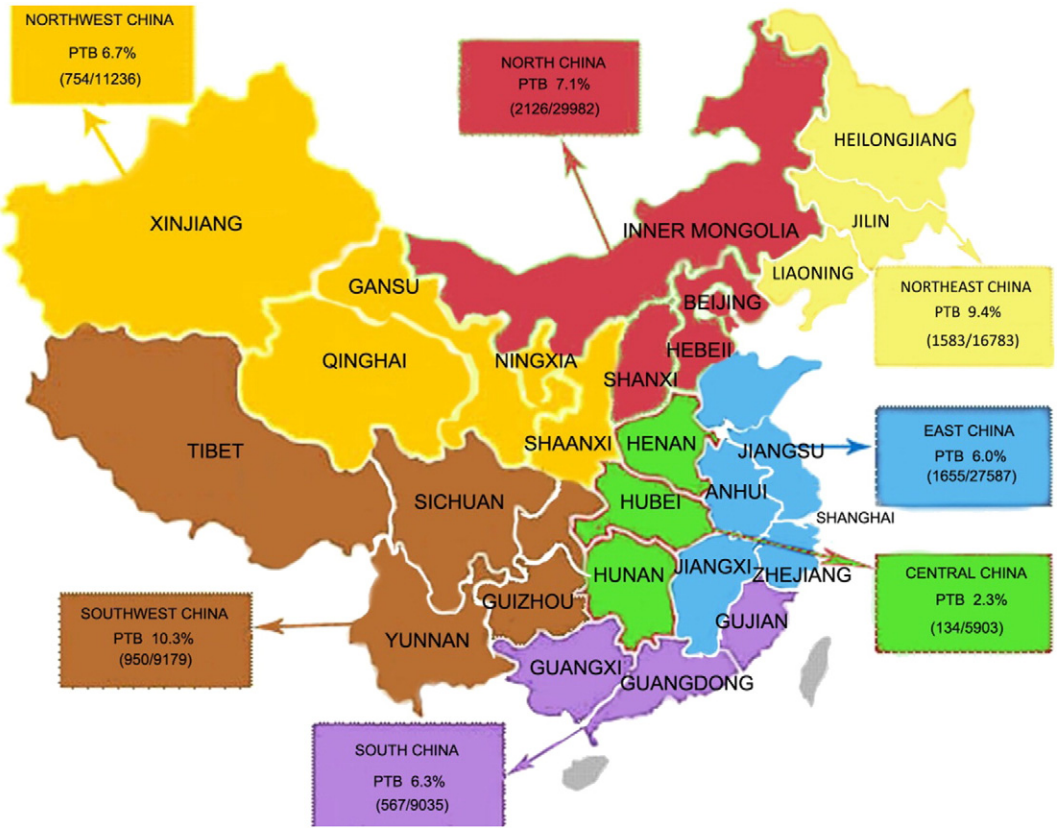

Fig. 2. Incidence and distribution of preterm births in mainland China in 2011. Data were abstracted for each administrative region from subcenters. Abbreviation: PTB, preterm birth.