Diapering Habits: A Global Perspective

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Abstract: There are tremendous variations in diapering practices, reflecting varying cultural practices and regional difference. Around the world, more than 134 million babies are born each year, a rate of 255 births per minute or 4.3 births each second. While global population growth has been steadily declining from its peak in 1963, several regions, including the Middle East and Sub-Saharan Africa, continue to maintain high birth rates. Though the essential needs of infants are largely similar, family habits and practices during early years of life vary dramatically. This article surveys data documenting variations in diaper frequency, types, and duration of use internationally, including age of toilet training. These factors may influence diaper rash and skin health of infants and young children. Much of this data was collected as part of an analysis of the international commercial diaper market, evaluated and organized as part of an international initiative on Global Infant Skin Care, and presented to a panel of experts for critique and commentary at a symposium held in December, 2013.

There are tremendous variations in diapering practices, reflecting varying cultural practices and regional differences. Around the world, more than 134 million babies are born each year, a rate of 255 births per minute or 4.3 births each second (1). Although global population growth has been steadily declining from its peak in 1963, several regions, including the Middle East and sub-Saharan Africa, continue to maintain high birth rates (2). Although the essential needs of infants are largely similar, family habits and practices during early years of life vary dramatically. This article surveys data documenting variations in diaper frequency, types, and duration of use internationally, including age of toilet training. These factors may influence diaper rash and skin health of infants and young children. Much of this data was collected as part of an analysis of the international commercial diaper market, evaluated and organized as part of an international initiative on global infant skin care, and presented to a panel of experts for critique and commentary at a symposium held in December 2013.

GLOBAL DIAPERING: BASIC DATA ON DIAPER USE

Cultural standards, family practices, and income significantly influence diapering habits. Diaper use is standard in most countries of the world. The materials...
used in diapers vary globally, with disposable diapers being most common but cloth diaper use high in some countries such as India and China (unpublished data) 3. Many factors influence the use of diaper type, including income and belief systems. Not only do the materials used in diapers vary globally, but also regional diapering practices influence the distribution of the form of diaper used. For instance, in Japan, babies are commonly changed while standing up rather than while lying on their backs, which has resulted in babies in Japan frequently wearing disposable pants to capture urine and feces before the baby is toilet trained. In North America and Western Europe, disposable pants are used almost exclusively during the time of toilet training. A similar “stand up” changing practice occurs in India and the Philippines, although in these countries, more than 80% of mothers report using cloth cotton underpants over disposable pants on their babies, probably because of cost and the perception of greater breathability with cotton (unpublished data) 3.

It is not uncommon in many countries for a baby to wear cloth and disposable diapers, as well as traditional diapers and pant forms. This depends on the development of their mobility (e.g., sitting, crawling, standing walking), which is remarkably similar globally, as well as the influences of habits, cultural norms, and income. Primarily in developing regions, some babies use disposable diapers exclusively for sleep or outings.

The frequency of diaper changing also varies according to region and country. In regions where cloth diapers are predominantly used, babies are changed more frequently. In high cloth usage markets, babies who wear cloth diaper are changed two to three times as frequently each day as babies wearing disposable diapers. In general, countries where disposable diapers are the preferred form tend to see fewer diaper changes per day, and these countries report similar numbers of diaper changes per day for both cloth and disposable forms (Fig. 2).

It is not surprising that older babies are changed less frequently than younger babies. In Western countries, older babies are changed approximately four to five times per day, compared with eight to 10 times per day for younger babies. This is likely driven by the change in the consistency and frequency of their stool as they begin eating solid food, but by the time babies in these regions weigh 10 to 16 kg, they are urinating approximately 60 mL of urine four to five times per day (5). For these babies, the average disposable diaper wear time is typically 4 hours during the day and up to 10 to 12 hours overnight. As they reach 1 year of age, babies typically sleep an average of 14 to 15 hours per day; most of their sleep at this age (~10–12 hours) occurs overnight, with one or two daytime naps (6). These babies urinate three to four times throughout the night, resulting in an average 220 mL of urine in the diaper (5). Therefore, the disposable diaper used must have the ability to absorb quickly and hold this large volume of urine to keep the baby’s skin dry.

Regardless of the country’s preferences in using cloth or disposable diapers, babies tend to wear cloth diapers for significantly fewer months than babies wearing disposable diapers. Those using cloth diapers appear to be toilet trained at a younger age or are moved to disposable diapers as they get older. Cultural norms greatly influence the age at which a baby begins toilet training. High cloth diaper usage markets, such as India and China, tend to begin toilet training babies when they are younger than 1 year in

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**Figure 1.** Use of cloth and disposable diaper forms according to country in infants aged 0 to 24 months old (%). Grey, cloth diaper; Brown, cloth pant; Blue, disposable diaper; Yellow, disposable pant.

**Figure 2.** Diaper change frequency according to country in infants aged 0 to 24 months (number per day): More cloth than disposable diapers appear to be used on a daily basis. Grey, cloth diaper; Blue, disposable diaper.
age. Russia, although predominately a disposable diaper usage market, also follows this practice of early toilet training. There is remarkable international variance in the average age on initiation of toilet training (Fig. 3). In European countries such as Germany, France, and the United Kingdom, as well as the United States and Japan, babies typically do not begin toilet training until approximately 2 years of age ((unpublished data) 3). Babies use many diapers before toilet training. On average, babies in North America and Western Europe wear more than 3,500 diapers before they are toilet trained (7).

VARIATIONS IN FAMILY COMPOSITION AND WORK OUTSIDE THE HOME

Worldwide, one-third of mothers are first-time mothers. Birth rates vary widely; 2014 estimates indicate that women in Niger (with the highest fertility rate globally) will have 6.89 babies on average (8), whereas elsewhere, aside from certain areas in Latin America, the Middle East, and Asia, mothers may have fewer than two babies (2). There are great variations in family units; although most mothers are married and live with their spouse, this may be less common than in the past. In many parts of the world, mothers work outside the home to support their families, although most do not work full time. The exception to this is the United States ((unpublished data) 3).

To help raise their children, many mothers rely on extended family, who heavily influence their care practices and habits. This is especially true in China, India, the Philippines, Argentina, and Russia. Of factors other than family members that may influence parental decisions on diaper care, income disparity and methods to access information (e.g., access to cell phones and Internet) have great influence on parenting practices and decisions on the type and form of diapers used ((unpublished data) 3).

Households using cloth diapers may have different needs and habits based on their cultural norms and traditional family practices. These families often live in multigenerational homes, with parents-in-law frequently involved in the baby's daily care. Caregivers of babies using cloth diapers may check and change diapers more frequently, and consequently, they tend to encourage earlier toilet training ((unpublished data) 8).

SLEEP HABITS AND OVERNIGHT DIAPER CHANGES

An important influence on diapering practices is baby sleep habits. Where babies sleep may strongly influence the nighttime changing routine. Although babies in many countries sleep alone in a crib, up to 90% of babies in certain countries, such as the Philippines and India, sleep in bed with their parents (2). One study that Procter & Gamble conducted in exclusive users of cloth diapers found that more than 50% of the mothers reported three or more diaper changes per night and that nearly one-third reported four or more diaper changes per night (9). A follow-up study observed a higher frequency of nocturnal diaper changes and infant sleep disruptions, as well as shorter sleep periods, in babies who wear cloth diapers at night than in those using disposable diapers (10).

DISPOSABLE DIAPERS: POTENTIAL BENEFITS TO SKIN HEALTH

Studies have indicated that disposable diapers are associated with better hygiene (11,12). Research in the United States has shown hygiene benefits versus cloth benefits in day care environments. Children in day care centers commonly have diarrhea due to rotavirus, giardia, and bacterial pathogens. A 2007 study found that the hands of child care providers and surfaces in day care centers tested positive for rotavirus antigen (13). A recent study conducted in China illustrated the significance of fecal contamination in homes where cloth diapers are most frequently used (14). Over the course of 4 weeks in China, 450 homes were tested for fecal contamination. The study found significantly higher rates of fecal contamination on the mother’s hands and on the hands of secondary caregivers in cloth diaper users than in those using disposable diapers (15).

Research supports the premise that disposable diapers may maintain skin health and reduce the risk
of diaper dermatitis (16). Modern disposable diapers offer a range of features that offer benefits to babies, specifically in protecting the skin through efficient absorbency and wetness protection. Leading disposables today offer an acquisition layer and a backsheet that contribute to greater performance and maintenance of skin health. These multilayer cores move wetness away from the skin and hold it to avoid rewetting the skin (unpublished data 3).

Another variable in diaper use is management of diaper rash and the use of diaper creams. In some parts of the world, mothers are more likely to use diaper creams at every change, whereas other areas report bathing more frequently or trying to leave the skin bare until an irritation or rash is resolved (Table 1) (unpublished data 3).

FOLLOWING THE CHANGING LANDSCAPE OF GLOBAL DIAPERING HABITS

The habits and practices related to diapering continue to vary greatly around the world and are continually evolving based on changing cultural norms, disposable income, and access to information. One factor remains constant—the highly influential familial guidance and social environment of the mother. Opportunities are increasingly abundant to engage mothers around the world through new media channels and networks and to educate them on the trends in diapering, as well as the potential skin, sleep, and hygiene benefits of good diapering practices.

CONFLICTS OF INTEREST

Lawrence F. Eichenfield has served as a consultant for Procter and Gamble.

REFERENCES

8. Procter & Gamble Data on File.

TABLE 1. Caregiver Responses to Diaper Rash

<table>
<thead>
<tr>
<th>Response</th>
<th>Argentina</th>
<th>United States</th>
<th>United Kingdom</th>
<th>France</th>
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<th>Russia</th>
<th>Saudi Arabia</th>
<th>India</th>
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<td>59</td>
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<td>21</td>
<td>23</td>
<td>15</td>
<td>3</td>
<td>12</td>
<td>—</td>
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<tr>
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<td>10</td>
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<td>1</td>
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<td>6</td>
<td>6</td>
<td>—</td>
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<td>5</td>
<td>26</td>
<td>4</td>
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