



The New World Health Organisation Growth Charts

Magda Sachs, PhD

Breastfeeding Supporter, The Breastfeeding Network

[AIMS Journal 2007, Vol 19, No 3](#)

The answer to all our problems with weighing breastfed babies? Magda Sachs discusses the value of the new WHO Growth Charts

Towards the end of 2006 the long-awaited World Health Organisation (WHO) growth charts appeared, and are now freely downloadable from the WHO website. These are the result of sixteen years' work and of a huge investment of time and effort in the six countries where the data was collected.

The data used to construct the charts covering the first two years is from babies whose mothers intended to breastfeed exclusively to at least four months (the design was done when this represented the minimum international recommendation), neither of whose parents smoked, and from families where there were unlikely to be economic constraints on growth. Mothers who agreed to take part received free access to skilled breastfeeding support as well as fortnightly contact with those measuring the baby's growth. The variations within the data collected in each country were greater than the variation between the countries, so the growth pattern applies to all babies, regardless of ethnicity. The charts thus depict how babies 'ought' to grow when their nutritional and other needs are met and represent optimal biological growth.

In September, the UK's Scientific Advisory Committee on Nutrition (SACN) constituted a sub-group to consider whether these charts should be adopted for use in the UK (although, since they do not extend beyond the age of five, the current 'UK90'¹ charts are likely to be kept for use at older ages). An announcement as to their decision is now available on the SACN website (see text box for main recommendations).

During my two decades of involvement with voluntary breastfeeding support in the UK, there has been a steady critique of growth charts and their applicability to breastfed babies and for the last decade or so, there has been a growing feeling that 'when we have a chart based on breastfed babies, we won't get women being told to supplement because their babies are falsely diagnosed as not gaining enough weight'. I began my research degree investigating this area in 1999, and I have increasingly come to believe that this belief is simplistic, and that, while a tool is to be welcomed and supported, the WHO chart cannot become a 'magic bullet' solution for our current difficulties with routine weight monitoring and breastfed babies in the UK.

The WHO chart project was begun on the strength of a critique of the then current international chart which was based on US data, collected between the 1930's and 1970's. This over-represented infants fed infant formula milk from birth and their weight measurements were infrequent, making this chart poor in several respects. However, the international chart has never been in common use in the UK. The chart introduced in the late 1970's was the Tanner Whitehouse chart, while the UK90 was introduced in the 1990's and has been gradually adopted over the UK. These were both constructed using data from UK babies. There is also a UK 'Breast from Birth' chart, which may be in use in some areas, which is constructed from a subset of the data used in the UK90 chart². The crucial point to note is that the criticism of the international chart and its misrepresentation of the growth of breastfed babies has often simply been transferred to a criticism of the UK90 chart, which is actually based on children many of whom at least began by breastfeeding.

So, what is this difference in growth that is so important? The issue is that the shape of the curves for a set of babies exclusively breastfed is different from that of a set of babies who were exclusively infant formula fed. Breastfed babies tend to grow more quickly in the early weeks but between the ages of 2 to 5 months (the timing differs depending on the data set used) the curves as compared to those of artificially fed infants appear to 'falter', or fall below, as the average growth slows down. So a breastfed baby's weight gains plotted on a chart based on artificially fed infants may seem to be drifting down from the centile it was previously following from about this time, and may remain lower for some time. By the age of two years, this difference has disappeared.

Add to this the difference in initial weight loss just after birth - which is higher in breastfed babies born in hospitals in western settings than for their counterparts fed infant formula from birth - and the pattern of breastfed baby growth looks very different. After losing more in the early days, breastfed babies tend (if feeding is going well and they are normal, healthy babies) to gain rapidly for a few months, with growth slowing and steadying over the remainder of the first year. It should be emphasised that this growth, which is also the pattern depicted in the new WHO charts, is physiologically normal. Crucially, optimal growth is not necessarily maximum growth, with babies who gain the most weight in early childhood more likely to be overweight or obese as adults and at higher risk of heart diseases. However, after decades of artificial feeding, the growth of a never breastfed baby, with little weight loss after birth, slower growth in the early months, but greater gains after that, so that such babies are heavier than their

breastfed counterparts by the end of the first year, is understood culturally to be 'normal'.

This is exactly where, by depicting the breastfed baby pattern of growth, the new chart is hoped to be of help in supporting women who wish to continue breastfeeding but who may worry that their baby is not growing appropriately. The fear has been that health professionals may not have taken this sufficiently into account when advising mothers. Some researchers have noted evidence to support this. Mahon-Daly and Andrews³ made observations in a postnatal group noting that "simply falling off the percentile trajectory was often a lone reason for breastfeeding to be discouraged or questioned" by health visitors. Dykes and Williams⁴ found that women in their study who did not focus on infant weight gain breastfed for longer.

Preliminary comparison of the WHO chart and the UK90 indicates that fewer breastfed babies would be falsely identified as 'faltering' in growth in the later months of the first year, but that in the earlier months, more may appear to be faltering. The proposed pilot of the WHO chart is of crucial importance so that this latter effect does not lead to an increase in women being advised to give complementary formula or solids inappropriately.

It should be emphasised that the rationale for routine weighing is to weigh all babies and to identify those whose growth is unusual - either because their growth falls above or below the extreme centiles, or because there is marked centile crossing - and investigate these babies further. The unusual growth may be a sign that there is something wrong, either due to an organic condition or due to a feeding problem. An unusual absolute weight or growth pattern is not itself a 'disease', but a possible symptom. Investigation of these babies is worthwhile because, among those who are exhibiting unusual growth, there will be enough individuals with a problem to make further investigation worth the time and money. However, it is usual for parents to feel that the unusual growth pattern is in itself a 'diagnosis' of a problem and feel extremely anxious. It should also be stressed that weight is only one indicator and if there are other worrying signs, a normal absolute weight or growth pattern should not be used to dismiss investigation.

My qualitative research study investigated the effects of routine baby weighing on breastfeeding women. ^{5,6} I conducted an ethnographic study in two phases. In the first phase I sat in a baby clinic observing the ordinary weighing encounters between breastfeeding mothers and health visitors. In the second phase I conducted in-depth interviews with 14 women over the first six months. I found that weighing was rarely conducted in accordance with official technical recommendations and that instead of providing one way of assessing the health of a baby, weighing became the sole focus for both health visitors and mothers. Very minor fluctuations created a sense of worry. A rather poor understanding of the growth chart itself was evident by both women and health professionals.

The recommended frequency of routine weighing, once a baby has been transferred to community care, is set by Hall and Ellison⁷ as five or six times in the first nine months. (Of course, if a problem is suspected or identified, a baby may be weighed more often - this is not routine weighing.) The infant feeding report⁸ found that 53% of first time mothers reported attending clinic at least fortnightly when their babies were

four to five months old, showing that babies (who are usually weighed at every clinic visit) would be weighed significantly more frequently.

Variations such as recent bowel movements or daily fluctuations are likely to over-influence measurements taken close together - changes over a longer interval are more likely to reflect a true trend in growth. Further recommendations for babies to always be weighed at the same time of day (as there are individual daily fluctuations in weight) and in the same relation to a feed - that is, always just before or just after - were never mentioned to women as good practice. Indeed, these ways of ensuring that routine weight measurements give as accurate a picture as possible are not included in the notes for parents in the 'red book'¹ (parent-held child health record) or in 'Birth to Five'². Where there are several local clinics, or scales available in places such as baby massage classes or breastfeeding groups, babies may be weighed on different sets of scales, adding to the inaccuracy of the plotted growth record.

In my study I observed that women did not come to the clinic without weighing their babies, so that the weighing was done as a sort of entry ticket to see the health visitor about something, or even to come to the breastfeeding support group. This emphasis on weighing tended to focus discussions about the baby on the weight. This could work both ways, with minor fluctuations causing (most likely unnecessary) concern and instances where something that was troubling the mother not being well-explored because the weight was all right. Indeed, all the women in my study appeared to have healthy babies growing appropriately, but many expressed much anxiety about their baby's growth at various points.

During weighing encounters where the baby's weight was as both health visitor and mother expected, the language used by both showed their understanding of the chart, with praise for the baby who was 'following the line'. Thus if the next weight was plotted slightly below the line, mothers could worry and health visitors would have to explain that weight did not actually follow the line exactly. At the same time, there was especial praise if the baby was tracking along the fiftieth centile line, which women perceived as the normal line. Lucas et al¹⁰ have shown that parents are anxious for their children to grow normally, but all the data on the UK90 chart was collected from normal babies and, at any one point, represents the growth of a normal, healthy population. The fiftieth centile is simply the average of the population at any one time and not more normal than any other centile. There is no simple explanation of growth charts in the red book and, in my study, it took first time mothers some months to feel they had grasped how the chart works.

Because weight gain was a central focus, if there was concern about how the baby was feeding, intervention tended to be targeted to getting the baby to gain more. In practice, this meant that often the first thing tried was to give supplements of infant formula milk. A thorough check of how breastfeeding was going - including checking the physical position of mother and baby, attachment to the breast, frequency of feeding and night feeding - was rarely alluded to. Investigating all of these aspects takes time and skill on the part of health visitors. However, we should remember that the introduction of infant formula is a huge intervention. Unfortunately our cultural understanding is that infant formula milk is benign and unproblematic, with little value given to protecting exclusive breastfeeding. In my study I

never heard women or health visitors balancing the risks of introducing formula against deficits in weight. In fact, had they tried to do this, evidence would be hard to come by, as there is an astonishing lack of investigation into when formula supplementation is medically indicated¹¹

The results of my study suggest that there are many aspects of routine weight monitoring which need to be altered to improve its ability to support sustained breastfeeding. My study was small and conducted in one area of the UK. Astonishingly, there are very few other studies which examine the experience of weighing babies. Even more astonishingly, an international Cochrane review¹² found only two randomised controlled trials which examined routine weight monitoring (neither conducted in a developed country). Although the practice is carried out over most of the globe, it remains relatively unexamined. It may intuitively appear to be of obvious benefit, but decades of debate have been conducted as to what the benefits are, particularly for breastfed babies.

There are reasons to welcome the introduction of the new WHO growth charts in the UK, when they are adopted. They acknowledge the breastfed baby as the standard against which normal growth is measured. Adoption would also signal congruence with global policy, and we could hope that adoption of the Global Strategy on Infant and Young Child Feeding, full adoption of the Baby Friendly Hospital Initiative and the WHO/UNICEF Code of Marketing of Breastmilk Substitutes might follow. The introduction of a new chart could also provide the occasion for rethinking how charts are used. Better, more thorough, training for health professionals in understanding the chart and explaining it to parents, with better written information for parents could improve the impact of routine weighing on breastfeeding confidence. Indeed, this appears as a major recommendation from the working group. But hoping for a quick solution to current problems through simply changing the chart is probably just plain unrealistic

Recommendations from the Scientific Advisory Committee on Nutrition and the Royal College of Pediatrics and Child Health working group:

- The WHO growth standard should be adopted from the age of two weeks to the age of two years in the UK
- There should be a period of piloting and field testing - this will particularly focus on training needs for professionals
- Training for professionals should include clear guidance on interpreting weight in the first two weeks
- There should be standardized training on the chart for professionals and clear information and materials for parents

All of this is underpinned by the clear aim of increasing the duration of exclusive breastfeeding for UK babies.

Further reading

- WHO charts and further information can be downloaded at:

www.who.int/childgrowth/standards/en/

- WHO training materials can be downloaded at: www.who.int/childgrowth/training/en/
- UK charts and some background reading are available at: www.healthforallchildren.co.uk/
- Background papers about the decision about which chart to adopt in the UK were at the time of going to press available at:

www.sacn.gov.uk/meetings/workinggroups/growth_standards/2006_09_11.html

www.sacn.gov.uk/meetings/workinggroups/growth_standards/2006_10_30.html

References

1. Child Growth Foundation & Royal College of Paediatrics and Child Health. (2004) My personal child health record. Harlow Printing Ltd, South Shields.
2. Sachs M, Dykes F, & Carter B (2005). Weight monitoring of breastfed babies in the UK - centile charts, scales and weighing frequency. *Maternal and Child Nutrition* 1, 63-76.
3. Mahon-Daly P & Andrews GJ (2002). Liminality and breastfeeding: women negotiating space and two bodies. *Health and Place* 8, 61-76.
4. Dykes F & Williams C (1999). Falling by the wayside: a phenomenological exploration of perceived breast-milk inadequacy in lactating women. *Midwifery* 15, 232-246.
5. Sachs M, Dykes F, & Carter B (2006). Weight monitoring of breastfed babies in the UK - interpreting, explaining and intervening. *Maternal and Child Nutrition* 2, 3-18.
6. Sachs M, Dykes F & Carter B (2006) Feeding by numbers: an ethnographic study of how breastfeeding women understand their babies' weight charts. *Int Breastfeed J.* 2006 1, 29
www.internationalbreastfeedingjournal.com/content/1/1/29
7. Hall DMB & Elliman D (2003). *Health for All Children*, 4th ed. Oxford University Press, Oxford
8. Hamlyn B, Brooker S, Olienikova K, & Woods S (2002). *Infant Feeding 2000* The Stationary Office, London
9. Department of Health (2005). *Birth to Five*. COI, London
10. Lucas PJ, Arai L, Baird J, Kleijnen J, Law CM Roberts HM (2006) A systematic review of lay views about infant size and growth. *Archives of Disease in Childhood*. 92,120-7
11. Renfrew M, Woolridge MW, & McGill HR (2000). *Enabling women to breastfeed: a review of practices which promote or inhibit breastfeeding - with evidencebased guidance for practice* The Stationary Office, London.
12. Panpanich R & Garner P (1999). *Growth Monitoring in Children (Cochrane Review)*, Issue 4 ed. John Wiley & Sons, Ltd, Chichester.