PN-ABH-582

A WORKBOOK FOR POLICYMAKERS

PN-ABH-582

A WORKBOOK FOR POLICYMAKERS

Guide to Assessing the Economic Value of Breastfeeding

Center to Prevent Childhood Malnutrition
Ruth E. Levine, Ph.D.

Edited by Mildred Konan
MK Associates

October 1990

Revised February 1991

This is a publication of the
Social Sector Policy Analysis Project
Operated by the Academy for Educational Development
Contract No. PDC-0082-C-00-9080-00
Agency for International Development
Bureau for Program and Policy Coordination
Office of Policy Development and Program Review

GUIDE TO ASSESSING THE ECONOMIC VALUE OF BREASTFEEDING

What benefits and costs accrue from increases (or decreases) in the prevalence of breastfeeding?

Studies in numerous countries around the world have attempted to answer this question. They show that increases in the prevalence of breastfeeding are associated with several benefits:

- Decreases in national expenditures for breastmilk substitutes
- Decreases in public health care costs (because, for example, exclusive breastfeeding prevents much diarrheal disease)
- Decreases in family planning costs (because exclusive breastfeeding delays a woman's return to fertility after delivery)

Increases in the prevalence of breastfeeding may also be associated with costs such as:

- Decreases in tax revenues from local manufacturers of breastmilk substitutes
- Decreases in employment

How can planners evaluate whether health, nutrition, and family planning resources should be allocated toward breastfeeding promotion?

To make responsible decisions, planners must be aware of the economic contribution of breastfeeding and the costs associated with its decline. This guide presents a method for assessing the economic value of breastfeeding.

Application of this method will provide rough indicators of the public sector costs associated with breastfeeding and bottlefeeding. Because some of the calculations are based on averages over large

populations, the numbers resulting from these calculations may not be precise enough for planning on regional or local levels (for example, the number of diarrheal deaths). Many factors that are relevant for individual households have not been included in the calculations. Private sector institution costs, however, may be estimated from the calculations, although there will be other relevant factors not considered here.

Follow the instructions below, step by step, to obtain estimates of the various public sector costs associated with breastfeeding and bottlefeeding. In many cases you may not be able to locate definitive information. However, because this guide is designed to help provide a **rough** assessment, precise information is not essential and estimates are encouraged. (Refer to *The Economic Value of Breastfeeding: Four Perspectives for Policymakers* for examples of costs of several of the needed components such as training costs, costs of conferences and rooming-in.) Since it should be helpful to complete even a portion of this workbook, it is **not necessary** to fill in every question.

Because the costs and benefits of breastfeeding calculated in this workbook are based on several perspectives: national and public sector, as well as hospital and health services, it may be necessary to enlist the aid of diverse sources. For this reason the most time consuming part of workbook completion may be data gathering, and completion may require up to one week of effort. To facilitate data gathering, suggestions for possible sources of information are included.

Sources of Information by Section:

I. ASSESSING NATIONAL DATA: Ministry of Health; most recent Demographic and Health Survey; contraceptive prevalence surveys; regional or national health or nutrition surveys; State of the World's Children (UNICEF); Bureau of Statistics.

II. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH BREASTFEEDING: Ministry of Health; estimates from hospital pediatrics/obstetrics staff; Ministries of Finance or Commerce

III. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH INADEQUATE BREASTFEEDING PRACTICES:

Ministry of Health; most recent Demographic and Health Survey; hospital staff; Ministries of Finance or Commerce

I. NATIONAL DATA

Country _____

Date _____

Total population _____

Crude birth rate (CBR) _____ per 1,000

Infant mortality rate (IMR) _____ per 1,000

100 per 1,000 or more	= **high**
75-100 per 1,000	= **medium**
Below 75 per 1,000	= **low**

Prevalence of exclusive* breastfeeding from zero to six months:

_____ percent

60 % or more	= **high**
30 to 60 %	= **medium**
Less than 30 %	= **low**

Annual budget of the health sector _____

(indicate currency and be sure to report all other cost figures in the same currency)

* Exclusive defined as no other liquids or solids fed to the infant.

II. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH BREASTFEEDING

A. Breastfeeding Promotion

1. During the past year, were staff in any public institutions trained to promote breastfeeding among new mothers?

   ____ Yes

   ____ No (Skip to question 2)

Calculate staff cost:
Multiply number of public institutions with training _____
x number of trainers per institution _____
x yearly salary of trainers _____
x percent of trainer's time spent on breastfeeding promotion
_____.

Staff cost = _____

Calculate cost of materials:
Multiply number of public institutions with training _____
x number of training sessions per year _____
x cost of materials per training session _____

Materials cost = _____

Calculate cost of counseling new mothers:
Multiply number of births in public institutions per year
_____
x average number of hours of counseling per birth _____
x average hourly wage of counselors in public institutions
_____.

Cost of counseling = _____

2. Have there been changes within public institutions to allow rooming-in of new mothers and infants?

____ Yes

____ No (Skip to question 3)

Calculate cost of changes during the past year:
Multiply number of institutions in which changes were made

_____

x average cost of changes _____,
or, add the cost of changes in each institution to obtain the total.

Cost of changes
to allow rooming-in = _____

3. Are there mass media projects, conferences, or other activities designed to promote breastfeeding?

____ Yes

____ No (Skip to section B)

Calculate cost of media projects and conferences:
Multiply number of activities _____
x average cost of activities _____,
or, add the cost of each activity to obtain the total.

Cost of media projects
and conferences = _____

SUMMARY: COSTS OF BREASTFEEDING PROMOTION

Annual public expenditures for breastfeeding promotion (add costs derived from 1, 2, and 3 above) _____
Indicator 1

Percent of health budget devoted to breastfeeding promotion (divide indicator 1 by the annual health sector budget given in Section I _____ x 100 _____ %
Indicator 2

B. Contributions from Manufacturers of Breastmilk Substitutes

1. Are there any manufacturers of breastmilk substitutes in the country?

____ Yes

____ No (Skip to section III)

Calculate the annual net tax revenue from manufacturers:
Multiply the total annual net revenues of manufacturers of breastmilk substitutes _____
x the average tax rate _____ (percent),
and subtract total public subsidies to the manufacturers _____.

Net tax revenue from manufacturers = _____
Indicator 3

Calculate the total tax revenue derived from employees of manufacturers of breastmilk substitutes:
Multiply annual total wage in these firms _____
x average income tax rate _____ (percent).

Tax revenue from employees of manufacturers = _____
Indicator 4

Calculate percent of workers employed in manufacturing of breastmilk substitutes:
Divide number of workers employed in breastmilk manufacture _____
by number of workers in the country _____,
and multiply by 100.

Percent of workers employed in manufacturing of breastmilk substitutes = _____ %
Indicator 5

SUMMARY: CONTRIBUTIONS OF MANUFACTURERS OF BREASTMILK SUBSTITUTES

Copy estimates obtained above into this summary section, using the number keys provided.

Net tax revenue from manufacturers = _____
Indicator 3

Tax revenue from employees of manufacturers = _____
Indicator 4

Percent of workers employed in manufacturing of breastmilk substitutes = _____ %
Indicator 5

III. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH INADEQUATE BREASTFEEDING PRACTICES

Many studies show that infants that are adequately breastfed have a lower incidence of mortality and morbidity than those that are not. In this section, "excess mortality" refers to the difference between mortality occurring in the presence of inadequate breastfeeding practices, and that which would occur if all infants were breastfed exclusively during the first four-to-six months and then partially through at least the first year of life.

"Excess morbidity" and "excess cost" are similarly defined. Calculations require the use of data recorded in Section I.

Health and Health Services[1]

1. How many infants die of diarrheal disease and acute lower respiratory infection annually? If these figures are not known, a rate of 25 percent of infant deaths in each case is an average in many developing countries, and is used in the formulas below.

   Calculate number of infant deaths from diarrheal disease:
   Multiply total population _____ x CBR* _____
   x IMR* _____ x .25

   Number of infant deaths
   from diarrheal disease (DD deaths) = _____

   Calculate number of infant deaths from acute lower respiratory infection:
   Multiply total population _____ x CBR _____
   x IMR _____ x .25

   Number of infant deaths from acute lower
   respiratory infection (ARI deaths) = _____

   * See page 3.

Calculate "excess mortality" from DD and ARI, based on the prevalence of breastfeeding. Use the following formulas:

If prevalence (see page 3) is:

high	(DD deaths x .40) + (ARI deaths x .14)
medium	(DD deaths x .58) + (ARI deaths x .23)
low	(DD deaths x .76) + (ARI deaths x .35)

Excess mortality among inadequately breastfed infants due to diarrheal disease and acute lower respiratory infection = _____ deaths

Indicator 6

2. How many episodes of diarrheal disease and acute upper respiratory infection among infants are attributable to inadequate breastfeeding practices?

Average number of episodes of diarrheal disease per infant per year (DD episodes) = _____

Average number of episodes of acute upper respiratory infection per infant per year (ARI episodes) = _____

Calculate "excess morbidity" from DD and ARI, based on the prevalence of breastfeeding. Use the following formulas:

If prevalence is:

high	(DD episodes x .23) + (ARI episodes x .18) x total population x CBR
medium	(DD episodes x .35) + (ARI episodes x .29) x total population x CBR
low	(DD episodes x .50) + (ARI episodes x .44) x total population x CBR

Excess morbidity among inadequately breastfed infants due to diarrheal disease and acute upper respiratory infection = _____ episodes

Indicator 7

3. What is the annual public expenditure on the "excess morbidity" attributable to inadequate breastfeeding practices?

Calculate public expenditures on "excess morbidity":
Multiply average cost per episode _____
x excess morbidity due to DD and ARI episodes _____
x percent of episodes treated in public facilities _____

Annual public expenditures on excess morbidity among infants inadequately breastfed? = _____
Indicator 8

4. What percent of the health budget is devoted to "excess morbidity" attributable to inadequate breastfeeding?

Calculate percent of the health budget devoted to "excess morbidity":
Divide annual public expenditures on "excess morbidity" _____ by total annual health budget _____ and multiply by 100.

Percent of health budget devoted to excess morbidity attributable to inadequate breastfeeding practices = _____ %
Indicator 9

5a. What is the total annual cost of infant formula and supplies in public institutions?

Calculate total annual cost of infant formula and supplies in hospitals <u>for newborns</u> only partially or not breastfed:
Add average daily cost of formula _____, bottles _____, and nipples _____ to obtain total average daily cost of _____.
Multiply by the number of births in public institutions annually _____
x average length of stay of newborns _____
x percent of newborns only partially or not breastfed _____.

Total annual cost of infant formula and supplies in public institutions for newborns only partially or not breastfed = _____

Calculate total annual cost of infant formula and supplies in hospitals for other infants only partially or not breastfed:
Add average daily cost of formula _____, bottles _____, and nipples _____ to obtain total average daily cost of _____.
Multiply by the number of admissions of infants to public institutions annually _____
x average length of stay of infants _____
x percent of infants admitted who are only partially or not breastfed _____.

Total annual cost of infant formula and supplies in public institutions for other infants only partially or not breastfed =
_____

Calculate cost of formula distributed through Social Security or other government system (if any):
Multiply cost per kilo of infant formula _____
x number of kilos distributed through government system per year _____.

Total cost of formula distributed through Social Security or other government system = _____

b. What is the total annual cost of staff time for preparation of infant formula and feeding in public institutions?

Calculate total annual cost of staff time:
Multiply average daily wage of nursery personnel _____
x average percent of day required for all feedings of one infant _____
x number of births in public institutions per year_____
x national percentage of newborns only partially or not breastfed _____

Total annual cost of staff time = _____

c. What is the total annual "excess cost" of pharmaceuticals for maternal and infant care?

Calculate total annual "excess cost" of pharmaceuticals:
Multiply average cost of oxytocin per birth
for non-breastfeeding mother _____
x number of births in public institutions _____
x percent of newborns not breastfed _____ = _____
(Calculations assume that oxytocin is required only for non-breastfeeding mothers.)

Multiply average cost of glucose per birth
for partially or non-breastfed infant _____
x number of births in public institutions _____
x percent of newborns only partially or
not breastfed _____ = _____
(Calculations assume that glucose is required only for infants not exclusively breastfed.)

Total annual excess cost of pharmaceuticals (oxytocin and glucose) for maternal and child care = _____

Add the estimates developed in 5a, b, and c to obtain the following indicator:

Annual public expenditures on bottlefeeding supplies and staff time in health care institutions = _____
Indicator 10

6. What is the percent of the health budget devoted to supplies and staffing associated with bottlefeeding?

Calculate percent of health budget:
Divide annual public expenditures on bottlefeeding supplies and staff-time in health institutions by the by annual health budget (see Section I) _____ and multiply by 100.

Percent of health budget devoted to supplies and staffing associated with bottlefeeding = _____ %
Indicator 11

7. What is the total number of births currently averted by breastfeeding?

Calculate "number of births averted" based on the prevalence of breastfeeding. Use the following formulas:

If prevalence is:

high (Multiply current number of births _____ x 1)
medium (Multiply current number of births _____ x .8)
low (Multiply current number of births _____ x .6)

Total number of births averted annually by current breastfeeding practices = _____
Indicator 12

8. What is the total annual interest (service) on the country's debt attributable to the import of breastmilk substitutes?

Calculate cost of imported infant formula:
Multiply number of kilos of infant formula imported _____
x cost per kilo of imported formula _____ = _____

Calculate cost of imported milk used for infant feeding:
Multiply number of kilos of milk imported _____
x percent of imported milk used for infant feeding _____
x cost of imported milk per kilo _____ = _____

Calculate debt service related to importing breastmilk substitutes:
Add cost of imported infant formula _____ and milk used for infant feeding _____ = _____ and multiply by rate of interest owed on the external debt _____ = _____

Total annual interest on country's debt attributable to import of breastmilk substitutes = _____
Indicator 13

SUMMARY: HEALTH AND HEALTH SERVICES

Copy the estimates obtained above into this summary section, using the indicator numbers provided.

Excess mortality among inadequately breastfed infants due to diarrheal disease and acute respiratory infection = _____ **deaths**
Indicator 6

Excess morbidity among inadequately breastfed infants due to diarrheal disease and acute respiratory infection = _____ **episodes**
Indicator 7

Annual public expenditures on excess morbidity among inadequately breastfed infants = _____
Indicator 8

Percent of health budget devoted to excess morbidity attributable to inadequate breastfeeding = _____%
Indicator 9

Annual public expenditures on bottlefeeding supplies and staff time in health care institutions = _____
Indicator 10

Percent of health budget devoted to supplies and staffing associated with bottlefeeding = _____%
Indicator 11

Total number of births averted by breastfeeding = _____.
Indicator 12

Total annual interest on country's debt attributable to import of breastmilk substitutes = _____
Indicator 13

[1] *In this section, the formulas used to estimate the "excess" mortality and morbidity from less than adequate breastfeeding (defined as behavior other than exclusive breastfeeding during the first four-to-six months and then partial breastfeeding through at least the end of first year) are based on the results of research reported in: Levine, Ruth, et al. (1990), "Breastfeeding Saves Lives: An Estimate of the Impact of Breastfeeding on Infant Mortality," a report prepared by the Center to Prevent Childhood Malnutrition; Brown, K.H., et al. (1989), "Infant Feeding Practices and their Relationship with Diarrheal and Other Diseases in Huascar (Lima), Peru," Pediatrics. 83: 31- 40. and Victora, Cesar, et al. (1987), "Evidence for Protection by Breastfeeding Against Deaths from Infectious Diseases in Brazil," Lancet, August 8: 319-21. Because these formulas are based on information from several different sources, and because the categorizations of breastfeeding prevalence as "high," "medium," or "low" are rough, these estimates should be taken as general indicators of the magnitude of effect, not as precise figures.*

IV. CONCLUSION

The information derived from these calculations illustrates the potential:

- costs of breastfeeding promotion;
- revenue provided by breastmilk substitute industries;
- deaths and illnesses associated with inadequate breastfeeding practices;
- public sector costs of treatment of illnesses associated with inadequate breastfeeding practices;
- hospital and other institutional costs associated with inadequate breastfeeding practices;
- increases in fertility associated with inadequate breastfeeding practices;
- debt burden associated with importation of breastmilk substitutes.

With these data in hand, it is possible to assess the impact on infant health of current breastfeeding practices, and to estimate the number of infant deaths that could be avoided through improved breastfeeding practices.

The calculations can also illustrate what governments must spend to treat illnesses associated with inadequate breastfeeding practices, and to provide family planning services to compensate for the lack of **exclusive** breastfeeding in the first four-to-six months of life.

The costs of providing breastmilk substitutes either in the hospital or through public distribution programs can also be estimated. In addition, there are financial considerations attached to the amount of foreign exchange required to import such products, as well as the associated interest payments on any debt incurred thereby.

The above monetary costs can then be compared to the estimated costs of promotion of breastfeeding and to the revenues provided by the local manufacture of breastmilk substitutes. This information can be used to help policymakers plan health expenditures.

While decisions about infant feeding are made at the household level, they are strongly influenced by national and institutional policies. Therefore, changes in policies can be expected to affect breastfeeding rates and subsequent levels of mortality and fertility, as well as related national expenditures. The information obtained from this workbook can guide governmental decisions about such policies.

The following *Workbook* has been filled out as an example that can guide users when working with figures from their countries

A WORKBOOK FOR POLICYMAKERS

Guide to Assessing the Economic Value of Breastfeeding

Center to Prevent Childhood Malnutrition
Ruth E. Levine, Ph.D.

Edited by Mildred Konan
MK Associates

October 1990

Revised February 1991

This is a publication of the
Social Sector Policy Analysis Project
Operated by the Academy for Educational Development
Contract No. PDC-0082-C-00-9080-00
Agency for International Development
Bureau for Program and Policy Coordination
Office of Policy Development and Program Review

GUIDE TO ASSESSING THE ECONOMIC VALUE OF BREASTFEEDING

What benefits and costs accrue from increases (or decreases) in the prevalence of breastfeeding?

Studies in numerous countries around the world have attempted to answer this question. They show that increases in the prevalence of breastfeeding are associated with several benefits:

- Decreases in national expenditures for breastmilk substitutes
- Decreases in public health care costs (because, for example, exclusive breastfeeding prevents much diarrheal disease)
- Decreases in family planning costs (because exclusive breastfeeding delays a woman's return to fertility after delivery)

Increases in the prevalence of breastfeeding may also be associated with costs such as:

- Decreases in tax revenues from local manufacturers of breastmilk substitutes
- Decreases in employment

How can planners evaluate whether health, nutrition, and family planning resources should be allocated toward breastfeeding promotion?

To make responsible decisions, planners must be aware of the economic contribution of breastfeeding and the costs associated with its decline. This guide presents a method for assessing the economic value of breastfeeding.

Application of this method will provide rough indicators of the public sector costs associated with breastfeeding and bottlefeeding. Because some of the calculations are based on averages over large

populations, the numbers resulting from these calculations may not be precise enough for planning on regional or local levels (for example, the number of diarrheal deaths). Many factors that are relevant for individual households have not been included in the calculations. Private sector institution costs, however, may be estimated from the calculations, although there will be other relevant factors not considered here.

Follow the instructions below, step by step, to obtain estimates of the various public sector costs associated with breastfeeding and bottlefeeding. In many cases you may not be able to locate definitive information. However, because this guide is designed to help provide a **rough** assessment, precise information is not essential and estimates are encouraged. (Refer to *The Economic Value of Breastfeeding: Four Perspectives for Policymakers* for examples of costs of several of the needed components such as training costs, costs of conferences and rooming-in.) Since it should be helpful to complete even a portion of this workbook, it is **not necessary** to fill in every question.

Because the costs and benefits of breastfeeding calculated in this workbook are based on several perspectives: national and public sector, as well as hospital and health services, it may be necessary to enlist the aid of diverse sources. For this reason the most time consuming part of workbook completion may be data gathering, and completion may require up to one week of effort. To facilitate data gathering, suggestions for possible sources of information are included.

Sources of Information by Section:

I. ASSESSING NATIONAL DATA: Ministry of Health; most recent Demographic and Health Survey; contraceptive prevalence surveys; regional or national health or nutrition surveys; State of the World's Children (UNICEF); Bureau of Statistics.

II. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH BREASTFEEDING: Ministry of Health; estimates from hospital pediatrics/obstetrics staff; Ministries of Finance or Commerce

III. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH INADEQUATE BREASTFEEDING PRACTICES: Ministry of Health; most recent Demographic and Health Survey; hospital staff; Ministries of Finance or Commerce

I. NATIONAL DATA

Country ____

Date 1990

Total population 175,000,000

Crude birth rate (CBR) 29 per 1,000

Infant mortality rate (IMR) 83 per 1,000

100 per 1,000 or more	= high
75-100 per 1,000	= medium
Below 75 per 1,000	= low

Prevalence of exclusive* breastfeeding from zero to six months:
35 percent

60 % or more	= high
30 to 60 %	= medium
Less than 30 %	= low

Annual budget of the health sector $86,000,000
(indicate currency and be sure to report all other cost figures in the same currency)

* Exclusive defined as **no** other liquids or solids fed to the infant.

II. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH BREASTFEEDING

A. Breastfeeding Promotion

1. During the past year, were staff in any public institutions trained to promote breastfeeding among new mothers?

✓ Yes

____ No (Skip to question 2)

Calculate staff cost:
Multiply number of public institutions with training 50
x number of trainers per institution 1
x yearly salary of trainers $1,000
x percent of trainer's time spent on breastfeeding promotion 50%.

Staff cost = $25,000

Calculate cost of materials:
Multiply number of public institutions with training 50
x number of training sessions per year 2
x cost of materials per training session $100

Materials cost = $10,000

Calculate cost of counseling new mothers:
Multiply number of births in public institutions per year 100,000
x average number of hours of counseling per birth .25
x average hourly wage of counselors in public institutions $1.00.

Cost of counseling = $25,000

2. Have there been changes within public institutions to allow rooming-in of new mothers and infants?

____ Yes

✓ No (Skip to question 3)

Calculate cost of changes during the past year:
Multiply number of institutions in which changes were made

_____

x average cost of changes _____,
or, add the cost of changes in each institution to obtain the total.

Cost of changes
to allow rooming-in = _____

3. Are there mass media projects, conferences, or other activities designed to promote breastfeeding?

✓ Yes

____ No (Skip to section B)

Calculate cost of media projects and conferences:
Multiply number of activities 1
x average cost of activities $20,000
or, add the cost of each activity to obtain the total.

Cost of media projects
and conferences = $20,000

-25

SUMMARY: COSTS OF BREASTFEEDING PROMOTION

Annual public expenditures for breastfeeding promotion (add costs derived from 1, 2, and 3 above) $80,000
Indicator 1

Percent of health budget devoted to breastfeeding promotion (divide indicator 1 by the annual health sector budget given in Section I.0009302 x 100 0.09 %
Indicator 2

$80,000 ÷ $86,000,000

B. Contributions from Manufacturers of Breastmilk Substitutes

1. Are there any manufacturers of breastmilk substitutes in the country?

✓ Yes

____ No (Skip to section III)

Calculate the annual net tax revenue from manufacturers:
Multiply the total annual net revenues of manufacturers of breastmilk substitutes #10,000
x the average tax rate 1 (percent),
and subtract total public subsidies to the manufacturers
- 0 .

Net tax revenue from manufacturers = #1,000
Indicator 3

Calculate the total tax revenue derived from employees of manufacturers of breastmilk substitutes:
Multiply annual total wage in these firms $100,000
x average income tax rate 5 % (percent).

Tax revenue from employees of manufacturers = $5,000
Indicator 4

Calculate percent of workers employed in manufacturing of breastmilk substitutes:
Divide number of workers employed in breastmilk manufacture 1,000
by number of workers in the country 25,000,000
and multiply by 100.

Percent of workers employed in manufacturing of breastmilk substitutes = < 1 %
Indicator 5

< = less than

SUMMARY: CONTRIBUTIONS OF MANUFACTURERS OF BREASTMILK SUBSTITUTES

Copy estimates obtained above into this summary section, using the number keys provided.

Net tax revenue from manufacturers = $1,000
Indicator 3

Tax revenue from employees of manufacturers = $5,000
Indicator 4

Percent of workers employed in manufacturing of breastmilk substitutes = < 1 %
Indicator 5

III. ASSESSING PUBLIC SECTOR COSTS ASSOCIATED WITH INADEQUATE BREASTFEEDING PRACTICES

Many studies show that infants that are adequately breastfed have a lower incidence of mortality and morbidity than those that are not. In this section, "excess mortality" refers to the difference between mortality occurring in the presence of inadequate breastfeeding practices, and that which would occur if all infants were breastfed exclusively during the first four-to-six months and then partially through at least the first year of life.

"Excess morbidity" and "excess cost" are similarly defined. Calculations require the use of data recorded in Section I.

Health and Health Services[1]

1. How many infants die of diarrheal disease and acute lower respiratory infection annually? If these figures are not known, a rate of.25 percent of infant deaths in each case is an average in many developing countries, and is used in the formulas below.

   Calculate number of infant deaths from diarrheal disease:
   Multiply total population 175,000,000 x CBR* .029
   x IMR* .083 x .25

   Number of infant deaths from diarrheal disease (DD deaths) = 105,306

   Calculate number of infant deaths from acute lower respiratory infection:
   Multiply total population 175,000,000 CBR .029
   x IMR .083 x .25

   Number of infant deaths from acute lower respiratory infection (ARI deaths) = 105,306

   * See page 3.

Calculate "excess mortality" from DD and ARI, based on the prevalence of breastfeeding. Use the following formulas:

If prevalence (see page 3) is:

high (DD deaths x .40) + (ARI deaths x .14)

medium (DD deaths x .58) + (ARI deaths x .23)

low (DD deaths x .76) + (ARI deaths x .35)

(105,306 x .58) + (105,306 x .23)

Excess mortality among inadequately breastfed infants due to diarrheal disease and acute lower respiratory infection = 85,298 **deaths**

Indicator 6

2. How many episodes of diarrheal disease and acute upper respiratory infection among infants are attributable to inadequate breastfeeding practices?

Average number of episodes of diarrheal disease per infant per year (DD episodes) = 4

Average number of episodes of acute upper respiratory infection per infant per year (ARI episodes) = 6

Calculate "excess morbidity" from DD and ARI, based on the prevalence of breastfeeding. Use the following formulas:

If prevalence is:

high (DD episodes x .23) + (ARI episodes x .18) x total population x CBR

medium (DD episodes x .35) + (ARI episodes x .29) x total population x CBR

low (DD episodes x .50) + (ARI episodes x .44) x total population x CBR

4 x .35) + (6 x .29) x 175,000,000 x .029

Excess morbidity among inadequately breastfed infants due to diarrheal disease and acute upper respiratory infection = 15,935,500 **episodes**

Indicator 7

3. What is the annual public expenditure on the "excess morbidity" attributable to inadequate breastfeeding practices?

Calculate public expenditures on "excess morbidity":
Multiply average cost per episode $5.00
x excess morbidity due to DD and ARI episodes 15,935,500
x percent of episodes treated in public facilities 10%

Annual public expenditures on excess morbidity among infants inadequately breastfed? = $7,967,750
Indicator 8

4. What percent of the health budget is devoted to "excess morbidity" attributable to inadequate breastfeeding?

Calculate percent of the health budget devoted to "excess morbidity":
Divide annual public expenditures on "excess morbidity" $7,967,750 by total annual health budget $86,000,000 and multiply by 100.

Percent of health budget devoted to excess morbidity attributable to inadequate breastfeeding practices = 9 %
Indicator 9

5a. What is the total annual cost of infant formula and supplies in public institutions?

Calculate total annual cost of infant formula and supplies in hospitals <u>for newborns</u> only partially or not breastfed:
Add average daily cost of formula $.61, bottles $.0082, and nipples $.0082 to obtain total average daily cost of $.63.
Multiply by the number of births in public institutions annually 1,000,000
x average length of stay of newborns 2 days
x percent of newborns only partially or not breastfed 20%.
.63 X 1,000,000 X 2 X .20

Total annual cost of infant formula and supplies in public institutions for newborns only partially or not breastfed =
$252,000

Calculate total annual cost of infant formula and supplies in hospitals for other infants only partially or not breastfed:
Add average daily cost of formula $.61, bottles $.0082, and nipples $.0082 to obtain total average daily cost of $.63.
Multiply by the number of admissions of infants to public institutions annually 10,000
x average length of stay of infants 5 days
x percent of infants admitted who are only partially or not breastfed 60%.
.63 X 10,000 X 5 X .60

Total annual cost of infant formula and supplies in public institutions for other infants only partially or not breastfed = $18,900

Calculate cost of formula distributed through Social Security or other government system (if any):
Multiply cost per kilo of infant formula —
x number of kilos distributed through government system per year —.

Total cost of formula distributed through Social Security or other government system = 0

b. What is the total annual cost of staff time for preparation of infant formula and feeding in public institutions?

Calculate total annual cost of staff time:
Multiply average daily wage of nursery personnel $13.00
x average percent of day required for " feedings of one infant 10%
x number of births in public institutions per year 1,000,000
x national percentage of newborns only partially or not breastfed 20%

Total annual cost of staff time = $260,000

c. What is the total annual "excess cost" of pharmaceuticals for maternal and infant care?

Calculate total annual "excess cost" of pharmaceuticals:
Multiply average cost of oxytocin per birth
for non-breastfeeding mother $.20
x number of births in public institutions 1,000,000
x percent of newborns not breastfed 3% = $6,000
(Calculations assume that oxytocin is required only for non-breastfeeding mothers.)
.20 X 1,000,000 X .03
Multiply average cost of glucose per birth
for partially or non-breastfed infant $1.00
x number of births in public institutions 1,000,000
x percent of newborns only partially or
not breastfed 20% = $200,000
(Calculations assume that glucose is required only for infants not exclusively breastfed.)
1 X 1,000,000 X .20
Total annual excess cost of pharmaceuticals (oxytocin and glucose) for maternal and child care = $206,000
$200,000 + $6,000
Add the estimates developed in 5a, b, and c to obtain the following indicator:

Annual public expenditures on bottlefeeding supplies and staff time in health care institutions = $736,900
Indicator 10
$252,000 + $18,900 + $260,000 + $206,000

6. What is the percent of the health budget devoted to supplies and staffing associated with bottlefeeding?

Calculate percent of health budget:
Divide annual public expenditures on bottlefeeding supplies and staff-time in health institutions by the by annual health budget (see Section I) $86,000,000 and multiply by 100.

Percent of health budget devoted to supplies and staffing associated with bottlefeeding = <1 %
Indicator 11
$736,900 ÷ $86,000,000

7. What is the total number of births currently averted by breastfeeding?

Calculate "number of births averted" based on the prevalence of breastfeeding. Use the following formulas:

If prevalence is:

high	(Multiply current number of births ____ x 1)
medium	(Multiply current number of births 5,075,000 x .8)
low	(Multiply current number of births ____ x .6)

Total number of births averted annually by current breastfeeding practices = 4,060,000

Indicator 12

8. What is the total annual interest (service) on the country's debt attributable to the import of breastmilk substitutes?

Calculate cost of imported infant formula:
Multiply number of kilos of infant formula imported 100,000
x cost per kilo of imported formula $2.00 = $200,000

Calculate cost of imported milk used for infant feeding:
Multiply number of kilos of milk imported 100,000
x percent of imported milk used for infant feeding 10%
x cost of imported milk per kilo $1.00 = $10,000

Calculate debt service related to importing breastmilk substitutes:
Add cost of imported infant formula $200,000 and milk used for infant feeding $10,000 = $210,000 and multiply by rate of interest owed on the external debt 10% = $21,000

Total annual interest on country's debt attributable to import of breastmilk substitutes = $21,000

Indicator 13

SUMMARY: HEALTH AND HEALTH SERVICES

Copy the estimates obtained above into this summary section, using the indicator numbers provided.

Excess mortality among inadequately breastfed infants due to diarrheal disease and acute respiratory infection = 85,298 deaths
Indicator 6

Excess morbidity among inadequately breastfed infants due to diarrheal disease and acute respiratory infection = 15,935,500 episodes
Indicator 7

Annual public expenditures on excess morbidity among inadequately breastfed infants = $7,967,750
Indicator 8

Percent of health budget devoted to excess morbidity attributable to inadequate breastfeeding = 9 %
Indicator 9

Annual public expenditures on bottlefeeding supplies and staff time in health care institutions = $736,900
Indicator 10

Percent of health budget devoted to supplies and staffing associated with bottlefeeding = <1 %
Indicator 11

Total number of births averted by breastfeeding = 4,060,000
Indicator 12

Total annual interest on country's debt attributable to import of breastmilk substitutes = $21,000
Indicator 13

[1] *In this section, the formulas used to estimate the "excess" mortality and morbidity from less than adequate breastfeeding (defined as behavior other than exclusive breastfeeding during the first four-to-six months and then partial breastfeeding through at least the end of first year) are based on the results of research reported in: Levine, Ruth, et al. (1990), "Breastfeeding Saves Lives: An Estimate of the Impact of Breastfeeding on Infant Mortality," a report prepared by the Center to Prevent Childhood Malnutrition; Brown, K.H., et al. (1989), "Infant Feeding Practices and their Relationship with Diarrheal and Other Diseases in Huascar (Lima), Peru," Pediatrics. 83: 31- 40. and Victora, Cesar, et al. (1987), "Evidence for Protection by Breastfeeding Against Deaths from Infectious Diseases in Brazil," Lancet, August 8: 319-21. Because these formulas are based on information from several different sources, and because the categorizations of breastfeeding prevalence as "high," "medium," or "low" are rough, these estimates should be taken as general indicators of the magnitude of effect, not as precise figures.*