OneHealth Model

Intervention Treatment Assumptions

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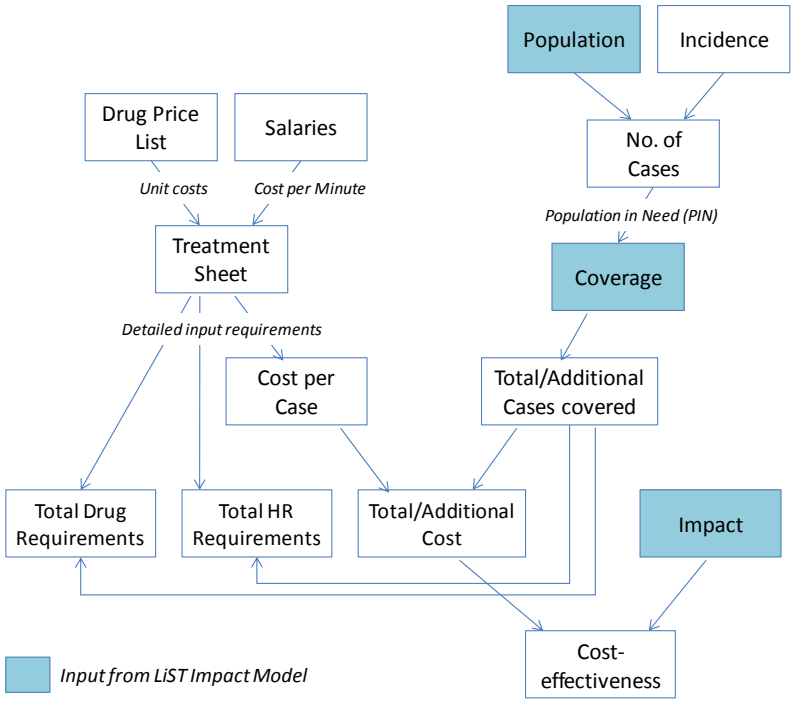
Background and Methodology

The following document outlines the treatment and costing assumptions made in the intervention costing module of the OneHealth Model. .

Interventions are costed using the ingredients or bottom-up approach. The model calculates both total and incremental cost. For now, the focus is on drugs and supplies costs. The module also attempts to provide estimates of the staff time requirements linked to an intervention as well as estimates regarding the number of visits (and hospital days where necessary) per average case. An attempt is made to also identify any major other cost items that can be directly linked to an intervention such as training or IEC without which the intervention could not be delivered.

To calculate the total and incremental cost of the interventions, the costing model first calculates the average cost per case for each of the interventions. It uses standard WHO protocols and expert opinion to specify the type and amount of drugs, supplies and personnel time required for each intervention and then costs these inputs using international drug prices (supplied by the UNICEF supply catalogue and MSH International Drug Price Indicator). The prices for drugs used in these interventions are provided in a file accompanying this document. It then identifies the population in need of the specific interventions and, using the coverage scale-up path specified by the user, calculates the number of women/newborns/children that currently receive the intervention and are projected to receive them in the future. It then multiplies the average cost per case with the number of cases to arrive at an estimate of the total cost of providing the intervention over the different years.

The following shows the different components and how they fit together:



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A more detailed explanation of the individual spreadsheets can be found on the worksheets themselves.

The model assumes that interventions are provided at one or several of the following four levels:

1. Community-level (through community health workers – CHWs)
2. Outreach
3. Clinic/health center
4. Hospital-level

The model contains suggestions as to where the individual interventions could/should be delivered (e.g. 50% at community level and 50% through outreach). These default values can be changed by the user.

9 SECTIONS

1. **Maternal/newborn and reproductive health**
2. **Child health**
3. **Vaccination**
4. **Malaria**
5. **TB**
6. **HIV/AIDS**
7. **WASH**
8. **Nutrition**
9. **Non-communicable diseases**

LIST OF INTERVENTIONS

Note: The following shows all the interventions grouped into the eight categories shown above. Some interventions potentially could be shown in other categories (e.g. folic acid supplementation either under Maternal Health or under Nutrition or malaria treatment of children either under Child Health or Malaria). The list below shows the default setup of the model. The user is encouraged to reassign interventions as desired.

MATERNAL, NEWBORN AND REPRODUCTIVE HEALTH

Interventions 1-11: Family Planning

Definition:
The following main family planning methods are currently included in the model:

1. Pill
2. Condom
3. Injectable
4. IUD
5. Implant
6. Female Sterilization
7. Male Sterilization
8. Lactation Amnorrrhea (LAM)
9. Vaginal Barrier
10. Vaginal tablets

Population in Need:
All women of reproductive age (15-49) in union[1]
The number of women requiring the different methods is calculated in the FamPlan module of the Spectrum tool series.

Possible Delivery Channels:
Delivery channel depending on method:

- Supply methods such as pills and condoms at community level, through outreach and at health center level
- Injectable, IUD and implant at health center or hospital
- Sterilization at hospital

Default assumptions used in the model (can and should be changed by the user to reflect local programming and circumstances):

	Pill	Condom	Injectable	IUD	Implant	Female Sterilization	Male Sterilization	LAM	Vaginal Barrier	Vaginal Tablets
Community Level	50%	50%								50%
Outreach	25%	25%	50%					50%		25%
Clinic	25%	25%	50%	50%	50%			50%	50%	25%
Hospital				50%	50%	100%	100%		50%	

Drugs and Supplies and Personnel Time required Per Woman:
Costs are calculated for one year of use for resupply methods such as pills, condoms and injectables. Costs for long-term methods are costs per new acceptor as almost all costs of those methods are incurred in the first year of use.
Note: For interventions delivered through clinical outreach, additional time for the health worker as well as some transportation cost is added to the cost.

Intervention 1: PILL

Description of treatment line	% Using	Note	Units
Levonorgestrel 0.15 mg + Ethinyl estradiol 30 mcg, cycle	50%	Combined pill (estrogen + progestagen in fixed doses)	15
Levonorgestrel 0.0375 mg, cycle	50%	Progestin only	15
TOTAL DRUGS AND SUPPLIES			

Staff Type	% treated by	Note	Total Minutes
Community Health Worker	50%	20 min counselling on FP+ 5 min physical exam + 3 x 5 min resupply visits	40
Nurse/Midwife - Outreach	25%	20 min counselling on FP+ 5 min physical exam + 3 x 5 min resupply visits	58

[1] *The default values for family planning come from Spectrum's FamPlan model. By default that model uses contraceptive prevalence among women in union (married or living in a long-term relationship). It is possible to change this denominator to ALL WOMEN by changing the CPR and method mix value in FamPlan.*

Nurse/Midwife	25%	20 min counselling on FP+ 5 min physical exam + 3 x 5 min resupply visits	40
ADDITIONAL INPUTS FOR OUTREACH	**25%**	4 outreach visits	4

The above defaults shows only two types of oral contraceptives. More options can be added in the treatment inputs editor.

Intervention 2: CONDOM

Description of treatment line	% Using	Note	Units
Condom, male	95%	120 condoms providing one year of protection	120
Condom, female	5%	120 condoms providing one year of protection	120
TOTAL DRUGS AND SUPPLIES			
Staff Type	**% treated by**	**Note**	**Total Minutes**
Community Health Worker	50%	20 min counselling on FP + 3 x 5 min resupply visits	35
Nurse/Midwife - Outreach	25%	20 min counselling on FP + 3 x 5 min resupply visits	53
Nurse/Midwife	25%	20 min counselling on FP + 3 x 5 min resupply visits	35
ADDITIONAL INPUTS FOR OUTREACH	25%	4 outreach visits	4

Intervention 3: INJECTABLE

Description of treatment line	% Using		Units
Gloves, exam, latex, disposable, pair	100%		1
Depot-Medroxyprogesterone Acetate 150 mg - 3 monthly	100%	Depot medroxy-progesterone acetate, injection	4
Syringe, Autodisable SoloShot IX	100%	For depo injection	4
Povidone iodine, solution, 10%	100%	For disinfection	4
TOTAL DRUGS AND SUPPLIES			
Staff Type	**% treated by**	**Note**	**Total Minutes**
Community Health Worker	0%	20 min counselling on FP + 4 x 5 min for injections	40
Nurse/Midwife - Outreach	50%	20 min counselling on FP+ 5 min physical exam + 4 x 5 min for injections	63
Nurse/Midwife	50%	20 min counselling on FP+ 5 min physical exam + 4 x 5 min for injections	45
TOTAL PERSONNEL			
ADDITIONAL INPUTS FOR OUTREACH	50%	4 outreach visits	4

Intervention 4: IUD

Description of treatment line	% receiving this treatment	Note	Treatment units per case/ episode
IUD, Copper T-380A	100%		1
Gloves, exam, latex, disposable, pair	100%	For IUD insertion and follow-up	2
Povidone iodine, solution, 10%	100%	Antiseptic for IUD insertion	1
TOTAL DRUGS AND SUPPLIES			
Staff Type	**% treated by**	**Note**	**Total Minutes**
Nurse/Midwife - Outreach	0%	20 min counselling on FP + 15 min Insertion + 1 x 10 min follow-up visit + 1 x 10 min removal	55
Nurse/Midwife	100%	20 min counselling on FP + 15 min Insertion + 1 x 10 min follow-up visit + 1 x 10 min removal	69

Intervention 5: IMPLANT

Description of treatment line	% Using	Note	Units per CYP
Implant, two rod - 75 mg levonorgestrel per rod	100%	Implant	1
Trocar	100%	For insertion, 1 trocar per 10 insertions	0.1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	100%	Local anaesthesia for insertion and removal	2
Syringe, needle+ swab	100%	For Lidocaine injection	2
Gloves, exam, latex, disposable, pair	100%	For IUD insertion, follow-up and removal	3
Povidone iodine, solution, 10%	100%	Antiseptic	1
TOTAL DRUGS AND SUPPLIES			
Staff Type	**% treated by**	**Note**	**Total Minutes**
Nurse/Midwife - Outreach	0%	20 min counselling on FP + 15 min Insertion + 1 x 10 min follow-up visit + 1 x 15 min removal	69
Nurse/Midwife	100%	20 min counselling on FP + 15 min Insertion + 1 x 10 min follow-up visit + 1 x 15 min removal	55

Intervention 6: FEMALE STERILIZATION

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Gloves, surgeon's, latex, disposable, sterile, pair	100%	Gloves	2	1	1	2
Povidone iodine, solution, 10%	100%	Antiseptic	1	1	2	2
Cotton swab	100%	For preparing abdominal area	1	1	2	2
Anaesthesia (local)						
Atropine sulphate, injection, 1 mg in 1-ml ampoule	100%	Pre-operative	1	1	1	1
Syringe, needle+ swab	100%	For atropine injection	1	1	1	1
Diazepam, injection, 5mg/ml in 2-ml ampoule	100%	Sedation	1	1	1	1
Syringe, needle+ swab	100%	For diazepam injection	1	1	1	1
Lidocaine, injection, 1% in 20 ml vial	100%	Local anesthesia	1	1	1	1
Syringe, needle+ swab	100%	For lidocaine injection	1	1	1	1
Lidocaine, spray, 10%	100%	To spary on fallopian tubes	1	1	1	1
Ligation and suturing						
Needle, suture, assorted sizes, round body	100%	For suture	3	1	1	3
Suture, catgut, chromic, 0, 150 cm	100%	To tie tube and close fascia and skin	3	1	1	3
Gauze pad, 10 x 10cm, sterile	100%	Dressing	2	1	1	2
Tape, adhesive, 2.5 cm wide	100%	To affix dressing	2	1	1	2
Other						
Paracetamol, tablet, 500 mg	100%	Pain management	1	4	2	8
TOTAL DRUGS AND SUPPLIES						

Staff Type	% treated by	Note				Total Minutes
Nurse/Midwife	100%	30 min counseling for woman and partner+ 30 min assistance during procedure + 10 min follow-up				70
Obstetrician	100%	Surgery + follow-up				30

Intervention 7: MALE STERILIZATION

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Gloves, surgeon's, latex, disposable, sterile, pair	100%		1	1	1	1
Povidone iodine, solution, 10%	100%	For cleaning the operative area	1	1	1	1
Lidocaine, injection, 1% in 20 ml vial	100%	Local anaesthesia (100mg or 10ml 1%)	1	1	1	1
Syringe, needle+ swab	100%	For lidocaine injection	1	1	1	1
Needle, suture, assorted sizes, round body	100%	For suture	1	1	1	1
Suture, catgut, chromic, 0, 150 cm	100%		1	1	1	1
Gauze pad, 10 x 10cm, sterile	100%	Dressing	1	1	1	1
Tape, adhesive, 2.5 cm wide	100%	To affix dressing	1	1	1	1
TOTAL DRUGS AND SUPPLIES						

Staff Type	% treated by	Note				Total Minutes
Nurse/Midwife	100%	30 min counseling for woman and partner+ 30 min assistance during procedure + 10 min follow-up				70
Obstetrician	100%	Surgery + follow-up				30

Intervention 8: LAM

LAM

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode

Staff Type	% treated by	Note				Total Minutes
Community Health Worker	0%	30 min counseling				40
Nurse/Midwife - Outreach	50%	30 min counseling				35
Nurse/Midwife	50%	30 min counseling				40

Intervention 9: Vaginal barrier

Intervention 10: Vaginal Tablets

Intervention 11: Other

Intervention 12. Safe Abortion

Definition:

3 methods – vacuum aspiration, medical and D&C

- Manual or electric vacuum aspiration, for up to 12 completed weeks since the woman's last menstrual period
- Medical method of abortion – a combination of mifepristone followed by a prostaglandin such as misoprostol or gemeprost, for up to 9 completed weeks since last menstrual period. Misoprostol is the prostaglandin of choice for most settings since it is cheap and does not require refrigeration.
- Dilatation and curettage (D&C) - should be used only where vacuum aspiration or medical methods of abortion are not available.

Population in Need:

Number of women requiring/choosing an abortion.

Table 1. Estimated number of induced abortions, by legal status, percentage of all abortions that are illegal, abortion rate and abortion ratio, all according to region and subregion, 1995

Region and subregion	No. of abortions (millions)			% illegal	Rate*	Ratio†
	Total	Legal	Illegal			
Total	**45.5**	**25.6**	**19.9**	**44**	**35**	**26**
Developed regions	**10**	**9.1**	**0.9**	**9**	**39**	**42**

Excluding Eastern Europe	3.8	3.7	0.1	3	20	26
Developing regions	**35.5**	**16.5**	**19**	**54**	**34**	**23**
Excluding China	24.9	5.9	19	76	33	20
Africa	**5**	**‡**	**5**	**99**	**33**	**15**
Eastern Africa	1.9	‡	1.9	100	41	16
Middle Africa	0.6	‡	0.6	100	35	14
Northern Africa	0.6	‡	0.6	96	17	12
Southern Africa	0.2	‡	0.2	100	19	12
Western Africa	1.6	‡	1.6	100	37	15
Asia	**26.8**	**16.9**	**9.9**	**37**	**33**	**25**
Eastern Asia	12.5	12.5	‡	§	36	34
South-central Asia	8.4	1.9	6.5	78	28	18
South-eastern Asia	4.7	1.9	2.8	60	40	28
Western Asia	1.2	0.7	0.5	42	32	20
Europe	**7.7**	**6.8**	**0.9**	**12**	**48**	**48**
Eastern Europe	6.2	5.4	0.8	13	90	65
Northern Europe	0.4	0.3	‡	8	18	23
Southern Europe	0.8	0.7	0.1	12	24	34
Western Europe	0.4	0.4	‡	§	11	17
Latin America	**4.2**	**0.2**	**4**	**95**	**37**	**27**
Caribbean	0.4	0.2	0.2	47	50	35
Central America	0.9	‡	0.9	100	30	21
South America	3	‡	3	100	39	30
Northern America	**1.5**	**1.5**	**‡**	**§**	**22**	**26**
Oceania	**0.1**	**0.1**	**‡**	**22**	**21**	**20**

*Abortions per 1,000 women aged 15–44. †Abortions per 100 known pregnancies. (Known pregnancies are defined as abortions plus live births.) ‡Fewer than 50,000. §Less than 0.5%. *Notes:* Developed regions include Europe, Northern America, Australia, New Zealand and Japan; all others are considered developing. Regions are as defined by the United Nations (UN) (see Appendix). Numbers do not add to totals due to rounding. *Sources:* **Populations--** UN, *The Sex and Age Distribution of the World Population, The 1996 Revision,* New York: UN, 1997. **Births--**UN, *World Population Prospects: The 1996 Revision, Annex II & III, Demographic indicators by major area, region and country,* New York: UN, 1996. **Illegal abortions--** WHO, 1998, op. cit. (see reference 4). **Legal abortions--**see text.

Source: Henshaw SK et al. The incidence of abortion worldwide. International Family Planning Perspectives, Supplement, 1999.
http://www.guttmacher.org/pubs/journals/25s3099.html

Possible Delivery Channels:

Clinic or hospital.

Default assumptions used in the model (can and should be changed by the user to reflect local policies and circumstances): 50% clinic/50% hospital.

Drugs and Supplies required Per Woman:

From: http://www.who.int/reproductive-health/publications/safe_abortion/safe_abortion.pdf

Pain management

Medication for pain management should always be offered. Three types of drugs, either singly or in combination, are used to manage pain during abortion: analgesics, which alleviate the sensation of pain; tranquillizers, which reduce anxiety; and anaesthetics, which numb physical sensation. In most cases, analgesics, local anaesthesia and/or mild sedation supplemented by verbal support, are sufficient. Where mechanical cervical dilatation is required for surgical abortion, a paracervical block, using a local anaesthetic such as the rapidly acting lidocaine, injected beneath the cervical mucosa at the "four quadrant" positions around the cervix should be used to alleviate women's discomfort.

Vacuum aspiration

The preferred surgical technique for abortion up to 12 completed weeks of pregnancy is vacuum aspiration. Vacuum aspiration involves the evacuation of the contents of the uterus through a plastic or metal cannula, attached to a vacuum source. Electric vacuum aspiration (EVA) employs an electric vacuum pump. With manual vacuum aspiration (MVA), the vacuum is created using a hand-held, hand-activated, plastic 60ml aspirator (also called a syringe). Available aspirators accommodate different sizes of plastic cannulae, ranging from 4 to at least 12mm in diameter. Some cannulae and most aspirators are re-usable after being cleaned and high-level disinfected or sterilized. Foot-operated mechanical pumps are also available. Depending on the duration of pregnancy, abortion with vacuum aspiration takes from 3 to 10 minutes to complete and can be performed on an outpatient basis, using analgesics and/or local anaesthesia. In very early pregnancy, the cannula may be inserted without prior dilatation of the cervix. Usually, however, dilatation using mechanical or osmotic dilators, alone or in combination with a prostaglandin, or cervical priming with pharmacological agents such as mifepristone or a prostaglandin (misoprostol or gemeprost), is

required before insertion of the cannula. Most women who have first-trimester abortions with local anaesthesia feel well enough to leave the health care facility after observation for about 30 minutes in a recovery room.

Dilatation and curettage
Dilatation and curettage (D&C), also known as "sharp curettage", involves dilating the cervix with mechanical dilators or pharmacological agents and using sharp metal curettes to scrape the walls of the uterus. Dilatation and curettage is less safe than vacuum aspiration (Cates et al. 2000) and considerably more painful for women (Grimes et al. 1977). Vacuum aspiration has replaced D&C in routine use in most industrialized countries and in many others. The rates of major complications of D&C are two to three times higher than those of vacuum aspiration (Grimes and Cates 1979)

Medical abortion
200 mg mifepristone followed after 36-48 hours by 1.0 mg vaginal gemeprost
or
800 µg vaginal misoprostol
or
400 µg oral misoprostol up to 7 completed weeks

Most protocols require that women take both mifepristone and prostaglandin under clinical supervision, involving a second visit to the health care facility two days after receiving mifepristone to take the prostaglandin. Women may leave the facility shortly after taking the mifepristone, after being told to expect bleeding and possible expulsion of products of conception, how to recognize complications and whom to contact if they should occur. Staff should be available on a 24-hour basis to respond to such situations. Following administration of the prostaglandin at the second visit, the standard observation period is 4-6 hours, during which up to 90% of women will expel the products of conception.
For pain managment: Paracetamol tablets, 500mg : 1 tab twice a day, for 3 days.

Personnel Time Required per Case:
Current assumption:
1) VAC Nurse 30 minutes
2) Medical abortion Nurse 2 x 10 minutes
3) D&C Nurse 30 minutes

Below the current default setup of drugs and supplies included in the model.

Drug/medical supply	% of women	Comments	Units	Times per Day	Days	Total Units
D&C, anaesthesia						
Lidocaine, injection, 1% in 20 ml vial	0	Local anaesthesia	1	1	1	1
Syringe, needle+ swab	0	For Lidocaine injection	1	1	1	1
Oxytocin, injection, 10 IU in 1 ml ampoule	0	To induce contraction of uterus, IM	1	1	1	1
Syringe, needle+ swab	0	For oxytocin injection	1	1	1	1
Vacuum aspiration						
Misoprostol, tablet, 200mcg	50	Priming of the cervix	2	1	1	2
Lidocaine, injection, 1% in 20 ml vial	50	Local anaesthesia	1	1	1	1
Syringe, needle+ swab	50	For Lidocaine injection	1	1	1	1
Medical abortion						
Misoprostol, tablet, 200mcg	50		4	1	1	4
Paracetamol, tablet, 500 mg	50		1	2	3	6

Intervention 13: Postabortion case management

Definition:
Treatment of women experiencing complications after undergoing unsafe abortions. Complications include haemorrhage, sepsis, peritonitis, and trauma to the cervix, vagina, uterus, and abdominal organs

Population in Need:
It is assumed that at least 20% of unsafe abortions result in complications that require hospitalization.
Source: Liskin L. Complications of abortion in developing countries. Popul Rep F 1980; F105–55.

Number of Cases: WRA 15-49 x Abortion Rate x % that are illegal x 20%.
Source for both abortion rate and % illegal – Henshaw et al. See intervention 12.

Possible Delivery Channels:

Model default assumptions: 100% hospital.

Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Manual Vacuum Aspiration						
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	Gloves	1	2	1	2
Tetanus toxoid, injection	50%	If uncertainty of vaccination history	1	1	1	1
Syringe, disposable, 2 ml, with needle	50%	For tetanus injection	1	1	1	1
Povidone iodine, solution, 10%	50%	Antiseptic	1	1	1	1
Cotton swab	50%	To apply antiseptic	1	1	1	1
Oxytocin, injection, 10 IU in 1 ml ampoule	100%	To firm myometrium, reduce risk of perforations	1	1	1	1
Sodium lactate (Ringer) + set, 500ml	100%	Shock: fluid restoration, Uterine lacerations, ruptured ectopic - general anaesthesia	2	1	1	2
IV giving/infusion set, with needle	100%	for drip	1	1	1	1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	100%	Local anaesthesia	1	1	1	1
Syringe, disposable, 10 ml, with needle	100%	for lidocaine injection	1	1	1	1
Repair of Lacerations						
Needle, suture, assorted sizes, round body	25%	Suture of tears and lacerations	2	1	1	2
Suture, catgut, chromic, 1, 150 cm	25%	Suture of tears and lacerations	2	1	1	2
Treatment of Sepsis						
Ampicillin, powder for injection, 500mg, vial	100%	2g IV every 6 hours until fever-free for 48 hours	4	4	4	64
Water for injection, 5 ml ampoule	100%	For ampicillin	4	4	4	64
Gentamycin, injection, 40 mg (as sulfate)/ml in 2-ml vial	100%	80mg IM every 8 hours	1	4	3	12
Metronidazole, injection, 500 mg in 100 ml vial	100%	500mg IV every 8 hours	1	3	4	12
Sodium chloride, injectable solution, 0,9% isotonic, 500ml	25%	Shock/IV fluid for antibiotics	1	2	4	8
IV giving/infusion set, with needle	25%		1	1	1	1
Lancet, blood, disposable	25%	To take blood for complete blood count	1	1	1	1
Complete blood count	25%	Blood Count	1	1	1	1
Catheter, Foley, Ch 12	25%	Control of urine output	1	1	1	1
Bag, urine, 2000ml	25%	Urine collection	1	1	1	1
Other						
Oxygen, inhalation (medicinal gas)	10%	Shock: Oxygen 3 hours at 6-8 liters/min	13.5	1	1	14
Paracetamol, tablet, 500 mg	25%	Pain management	1	4	2	8

Personnel Time Required per Case:

Type of Staff	% treated by this type of staff	Note	Minutes	Times per Day	No. of Days/ Visits	Total No. of Minutes

Auxiliary/Attendant	50%	During hospitalization, 30 minutes a day	30	1	3	90
Nurse/Midwife	100%	MVA, treatment for sepsis and shock, postabortion and FP counseling	90	1	1	90
General Physician	0%					
Obstetrician	50%	Repair of lacerations, etc.	30	1	1	30

Intervention 14: Ectopic pregnancy case management

Definition:
An ectopic pregnancy is a complication of pregnancy in which the embryo implants outside the uterine cavity. With rare exceptions, ectopic pregnancies are not viable. Most ectopic pregnancies occur in the Fallopian tube, but implantation can also occur in the cervix, ovaries, and abdomen. In developing countries, ectopic pregnancies are usually only recognized when they have ruptured or are in danger of rupturing requiring surgical intervention.

Population in Need:
About 2% of pregnancies occur outside the uterus. If left untreated, about half of ectopic pregnancies will resolve without treatment. It is assumed that in developing countries about 1% of all pregnancies will require a laparoscopy or laparotomy.

Possible Delivery Channels:
Model default assumptions: 100% at hospital.

Drugs and Supplies required Per Woman:

Drug/medical supply	% of women	Comment	Units	Times per Day	Days
Anesthesia					
Sodium lactate injection (Ringer's), 500ml, with giving set	100	To preload and avoid hypotension	2	1	1
IV giving/infusion set, with needle	100	for drip during surgery	1	1	1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	100	spinal anaesthesia	1	1	1
Syringe, needle+ swab	100	for lidocaine injection	1	1	1
Epinephrine, ampoule, 1mg/ml	50	Adrenaline, 0.25ml, if anest. > 45 min	0.5	1	1
Epinephrine, ampoule, 1mg/ml	10	If low blood pressure, 0.2mg/kg	1	1	1
Syringe, needle+ swab	10	for epinephrine injection	1	1	1
Surgery Supplies					
Suture, absorbable, synthetic, 2/0, curved needle	100	Transfixation and tieing of the mesosalphinx	1	1	1
Suture, catgut, chromic, 0, 150 cm	100	Closing of the fascia	1	1	1
Suture, non-absorbable, synthetic, 3/0, curved needle	100	Closing of the skin	1	1	1
Gauze pad, 10 x 10cm, sterile	100	Dressing	3	1	1
Infection control					
Sodium chloride, injectable solution, 0,9% isotonic, 500ml	100	IV fluid for antibiotics	1	2	4
Ampicillin, powder for injection, 500mg, vial	100	2g IV every 6 hours until fever-free for 48 hours	4	4	4
Gentamycin, injection, 40 mg/ml in 2ml vial	100	80mg IM every 8 hours	1	4	3
Metronidazole, injection, 500 mg in 100 ml vial	100	500mg IV every 8 hours	1	3	4
Pain management					
Paracetamol, tablet, 500 mg	100		1	4	3
Pethidine, 50 mg/ml, 2ml ampoule	100	Analgesic, IM	1	1	2

Source: IMPAC. Managing Complications in Pregnancy: Salpingectomy for Ectopic Pregnancy, p. 109

Personnel Time Required per Case:
Assumption that it will take about an hour of a ObGyn's time (for the surgery) + 2 hours of an anesthetist + 3 hours of a nurse's time (assisting during surgery,pre- and post-op+ 20 minutes a day during hospitalization).

Hospital Days:
3 days

Intervention 15: Basic ANC

Definition:

Population in Need:
All pregnant women.

Possible Delivery Channels:
Default assumption: 100% clinic level (can, of course, be changed by user).

Drugs and Supplies required Per Woman:
None.

Personnel Time Required per Case:
10 min of a nurse/midwife's per women times a minimum of 4 visits. Recommended length of 20 minutes per visits includes other intervention recommended to be undertaken during routine ANC (such as tetanus toxoid, syphilis detection and treatment, etc.) which are dealt with separately in this model.
Source: WHO. Pregnancy, childbirth, postpartum and newborn care - A guide for essential practice. http://whqlibdoc.who.int/publications/2006/924159084X_eng.pdf

Intervention 16: Tetanus Toxoid (pregnant women)

Definition:
2 tetanus toxoid immunizations as part of ANC.

Population in Need:
All pregnant women.

Possible Delivery Channels:
During routine ANC.

Model default assumption that intervention is undertaken during routine ANC, delivery mechanism thus the same as Intervention 15 (100% clinic-level).

Drugs and Supplies required Per Woman:
2 tetanus toxoid injections, syringes + needles ($0.34)

Personnel Time Required per Case:
Default assumption: Nurse 5 minutes total (2 visits @2.5 minutes each)

Intervention 17: Syphilis detection and treatment (pregnant women)

Definition:
Screening of all pregnant women by rapid plasma reagent test and treatment of sero-positive cases with penicillin during ANC visits.

Population in Need:
Screening - All pregnant women
Treatment – for those testing positive – Syphilis prevalence from WHO's WHR2005 global scale-up costing database (regional syphilis rates except where there are country specific data from EIP/WHO)

Possible Delivery Channels:
Assumed to be undertaken during routine ANC, delivery mechanism thus the same as Intervention 4 (100% clinic level)

Drugs and Supplies required Per Woman:
RPR Syphilis test + 1 injection of benzathine penicillin ($0.35)

Personnel Time Required per Case:

25 minutes of a nurse's time (15 minutes for testing, 5 minutes for injection and 5 minutes for follow up).[2]

Intervention 18: Hypertensive disease case management

Definition:
Hypertensive disorders of pregnancy (HDP) represent a group of conditions associated with high blood pressure during pregnancy. Women with pregnancy-induced hypertension disorders may progress from mild disease to a more serious condition. The classes of pregnancy-induced hypertension are:

- hypertension without proteinuria (covered in this intervention);
- mild pre-eclampsia;
- severe pre-eclampsia; (both covered under Intervention 19)
- eclampsia (covered under Intervention 28).

Population in Need:

Table 6.1. Hypertensive disorders of pregnancy: age-specific incidence and mortalit estimates for WHO epidemiological subregions, 2000.

Subregion	Age-specific Incidence/1000 women 15-49	Age-specific mortality/100,000 women 15-49
AFRO D	11.50	18.46
AFRO E	11.72	20.49
AMRO A	0.41	0.11
AMRO B	5.21	2.10
AMRO D	7.16	9.32
EMRO B	6.94	1.05
EMRO D	7.83	4.46
EURO A	0.34	0.05
EURO B1	3.67	0.58
EURO B2	4.80	0.72
EURO C	2.25	0.10
SEARO B	5.26	2.76
SEARO D	7.75	8.59
WPRO A	0.35	0.03
WPRO B1	3.76	0.07
WPRO B2	5.86	4.27
WPRO B3	9.03	4.68
World	5.35	4.56

Source: Doulea, AbouZhar. 2003. Global burden of hypertensive disorders of pregnancy in the year 2000 http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf

Possible Delivery Channels:
Default setting: 50% clinic, 50% hospital.

Drugs and Supplies required Per Woman:
Weekly testing for proteinuria (dipstick).

Personnel Time Required per Case:
Weekly visits for blood pressure monitoring and urine tests (10 minutes of a nurse's time per visit).

Intervention 19: Management of Pre-Eclampsia (Magnesium-Sulphate)

Definition:

[2] *MM: Tests can be done in batches but still require on average 15 min. Penicillin injection admin may take longer if test dose for penicillin sensitivity is done - again on average, consider 15 min per injection*

Hypertensive disorders of pregnancy (HDP) represent a group of conditions associated with high blood pressure during pregnancy. Women with pregnancy-induced hypertension disorders may progress from mild disease to a more serious condition. The classes of pregnancy-induced hypertension are (the first 3 are covered under this intervention):

- hypertension without proteinuria
- mild pre-eclampsia;
- severe pre-eclampsia;
- eclampsia (covered under Intervention 28).

Pre-eclampsia: Gestational hypertension with significant proteinuria (>= 0.3 g/l) after 20 weeks of gestation or during labor and/or within 48 hours of delivery

Population in Need:

Table 6.1. Hypertensive disorders of pregnancy: age-specific incidence and mortalit estimates for WHO epidemiological subregions, 2000.

Subregion	Age-specific Incidence/1000 women 15-49	Age-specific mortality/100,000 women 15-49
AFRO D	11.50	18.46
AFRO E	11.72	20.49
AMRO A	0.41	0.11
AMRO B	5.21	2.10
AMRO D	7.16	9.32
EMRO B	6.94	1.05
EMRO D	7.83	4.46
EURO A	0.34	0.05
EURO B1	3.67	0.58
EURO B2	4.80	0.72
EURO C	2.25	0.10
SEARO B	5.26	2.76
SEARO D	7.75	8.59
WPRO A	0.35	0.03
WPRO B1	3.76	0.07
WPRO B2	5.86	4.27
WPRO B3	9.03	4.68
World	5.35	4.56

Source: Doulea, AbouZhar. 2003. Global burden of hypertensive disorders of pregnancy in the year 2000 http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf

Table 3.1. Regional incidence rates for pre -eclampsia
2.8% of births for developing countries, 0.4% for developed

Table 3.1. Regional incidence rates for pre-eclampsia

WHO region	Pre-eclampsia incidence rate (% births)
AFRO D	2.8
AFRO E	2.8
AMRO A	0.4
AMRO B	2.8
AMRO D	2.8
EMRO B	2.8
EMRO D	2.8
EURO A	0.4
EURO B1	2.8
EURO B2	2.8
EURO C	2.8
SEARO B	2.8
SEARO D	2.8
WPRO A	0.4
WPRO B1	2.8
WPRO B2	2.8
WPRO B3	2.8

Doulea, AbouZhar. 2003. Global burden of hypertensive disorders of pregnancy in the year 2000 http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf

Possible Delivery Channels:
Default setting: 50% clinic, 50% hospital

Drugs and Supplies required Per Woman:
Hypertension only (40% of women): Weekly testing for proteinuria (dipstick).

Case management guidelines

a) Mild pre-eclampsia:

Gestation < 37 weeks:

Follow-up 2x a week as outpatient
Monitor blood pressure, urine (for proteinuria) and fetal condition weekly
Do not give anticonvulsants, antihypertensives, sedatives
If urinary protein levels increase manage as severe pre-eclampsia

Gestation > 37 weeks:

If there are signs of fetal compromise, expedite delivery

a) Favorable cervix: rupture membranes, induce labor using oxytocin
b) Unfavorable cervix: ripen cervix using prostaglandins or deliver by C-section

Based on: WHO. Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors, Page S-42

b) Severe pre-eclampsia:

Active management
Give oxygen at 4-6 litres per minute
Start an IV infusion
Give anticonvulsive drugs
If diastolic blood pressure remains above 110mm Hg, give antihypertensive drugs

Magnesium sulfate

Loading dose

- Give 4 g of 20% magnesium sulfate solution IV over five minutes.
- Follow promptly with 10 g of 50% magnesium sulfate solution: give 5 g in each buttock as a deep IM injection with 1 mL of 2% lignocaine in the same syringe. Ensure aseptic technique when giving magnesium sulfate deep IM injection. Warn the woman that a feeling of warmth will be felt when magnesium sulfate is given.
- If **convulsions recur after 15 minutes**, give 2 g of 50% magnesium sulfate solution IV over five minutes.

Maintenance dose

- Give 5 g of 50% magnesium sulfate solution with 1 mL of 2% lignocaine in the same syringe by deep IM injection into alternate buttocks every four hours. Continue treatment for 24 hours after delivery or the last convulsion, whichever occurs last.
- If 50% solution is not available, give 1 g of 20% magnesium sulfate solution IV every hour by continuous infusion.

Based on: WHO. Managing Complications in Pregnancy and Childbirth: A guide for midwives and doctors, Page S-43

Based on the above treatment guidelines, the table on the following page presents the complete list of drugs required (The following assumes that 90% of women have mild-pre-eclampsia (59% are under 37 weeks, 40% over), 1% have severe pre-eclampsia.

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Test strips, urinary protein	100%	Urine test	1	1	1	1
Catheter, Foley, Ch 14	100%	Control of urine output	1	1	1	1
Bag, urine, 2000ml	100%	Urine collection	1	1	1	1
High Blood Pressure (if diastolic BP > 110mmHg)						
IV giving/infusion set, with needle	100%	For drip	1	1	1	1
Sodium lactate (Ringer) + set, 500ml	100%	IV drip	1	1	1	1
Hydralazine, 20 mg/ml, ampoule 1 ml	100%	5mg IV or IM, repeat every 30 minutes as needed (max. 20mg)	1	1	1	1
Convulsions						
Sodium lactate (Ringer) + set, 500ml	20%	1 liter in 6-8 hours	4	1	1	4
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	4g (20ml of 20% solution) IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	In addition, 10g (10ml of 50% solution) as deep IM injection, 5g into each buttocks	1	1	1	1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	20%	For IM injection, 1ml, in same syringe as	1	1	1	1

		magnesium sulfate				
Syringe, disposable, 10 ml, without needle	20%	For magnesium sulfate IM injections	1	1	1	1
Needle, 21G, disposable	20%	For injection	1	1	1	1
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	If convulsions recur, after 15 minutes give 2g IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10%	Continue if woman is in late labour or referral delayed for long - 5g in altenate buttocks every 4 hours until 24 hours after birth	1	12	1	12
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	10%	For IM injection, 1ml, in same syringe as magnesium sulfate, also repeat every 4 hours	1	12	1	12

Personnel Time Required per Case:
Hypertension only (40% of women): Weekly visits for blood pressure monitoring and urine tests (10 minutes of a nurse's time per visit).

a) Mild pre-eclampsia: Midwife: 30 min / outpatient visit
b) Severe pre-eclampsia: Doctor : 30 min / visit

Number of outpatient visits:
a) Hypertension: Average 5 case visits
b) Mild pre-eclampsia: Average case 5 visits (from diagnosis to expedition of delivery).
c) Severe pre-eclampsia: 1 outpatient visit, then hospitalization

Hospitalization:
a) Mild: None
b) Severe: 5 days

Intervention 20: Treatment of other Pregnancy Complications

Anemia in Pregnancy included by default. Intervention can be modified to include or reference other complications.

Population in Need: 60% of pregnant women (anemia)

Possible Delivery Channels: 95% at clinic for moderate anemia + 5% at hospital for severe anemia

Drugs and Supplies required Per Woman:
Moderate anemia (clinic):
Ferrous sulfate: tablet; 60mg. Dose: 1 tablet per day for 90 days
Folic acid: tablet, 400 mcg. Dose: 1 tablet per day for 90 days
Severe anemia (Hospital):
Ferrous sulfate: tablet; 60mg. Dose: 2 tablets per day for 90 days

Folic acid: tablet, 400 mcg; Dose: 2 tablets per day for 90 days

Personnel Time Required per Case:
Including for other complications:
ObGyn; 5 min x 4 visits
Midwife/nurse: 10 minutes x 4 visits (counseling + dispensing medicine)

Intervention 21: Deworming (pregnant women)

Definition:
Treatment of hookworm infection in pregnant women with anthelmintic treatment.

Population in Need: Defined as the hookworm prevalence. On average, 15%.

Hookworm Prevalence

		Population at Risk	Infection Prevalence
LAC	530	346	10%
SSA	683	646	29%
MENA	313	73	3%
SAS	363	188	16%
India	1,027	534	7%
EAP	564	512	26%
China	1,295	897	16%
Total	**4,775**	**3,195**	**15%**

Source: DCPP. July 2003. Working Paper No. 12.
http://www.dcp2.org/file/27/wp12.pdf

Possible Delivery Channels:
Model default assumption that intervention is undertaken during routine ANC, delivery mechanism thus the same as Intervention 15 (100% clinic-level).

Drugs and Supplies required Per Woman:
Anthelmintic treatments:
- albendazole 400 mg by mouth once; should not be given during the first trimester of the pregnancy !
- OR mebendazole 500 mg by mouth once or 100 mg two times per day for three days;
- OR levamisole 2.5 mg/kg body weight by mouth once daily for three days;
- OR pyrantel 10 mg/kg body weight by mouth once daily for three days.

Personnel Time Required per Case:
2 minutes of a nurse's/midwife's time.

Intervention 22: Antenatal Corticosteroids

Definition:
Administration of steroids and inpatient care of women with suspected preterm labour.

Population in Need:
Women experiencing pre-term labour and those at high risk of going into pre-term labor
Proxy used for calculation of number of cases: Pregnancies x Regional rates of pre-term birth (WHO database, for country values see Annex.

Possible Delivery Channels:
This intervention should be delivered at hospital level.

	% of cases receiving treatment
Community Level	%
Outreach	%
Clinic	%
Hospital	100%

Drugs and Supplies required Per Woman:
Recommended: 2 doses of betamethasone, 12 mg injection (in WHR2005 global scale-up costing costed at $14.40 per woman)

Personnel Time Required per Case:
Doctor: 30 min to confirm diagnosis and prescribe treatment
Midwife 15 min a day for 2 days

Other Costs:
48 hours under observation (2 inpatient days)

Intervention 23: Antibiotics for pPRom

Definition:
Administration of oral antibiotics to women with preterm premature rupture of membranes.

Population in Need:
Women experiencing pPRoM
Proxy used by model: 1/3 of regional LBW rate.
Source: UNICEF Global Database, http://www.childinfo.org/low_birthweight_table.php, accessed Aug 2011

Delivery Level:
Default assumption 50% health center, 50% hospital.

Drugs and Supplies required Per Woman:
Erythromycin tablet, 250mg 4 x daily for 7 days ($0.80)

Personnel Time Required per Case:
Midwife: 15 min a day
Include time for monitoring labour.

Hospitalization:
Hospitalization until delivery (2 inpatient days are included by default).

Intervention 24: Induction of Labor (beyond 41 weeks)

Definition:
Induction of labor to prevent births at or beyond 41 completed weeks.
This intervention only includes the induction of labor with misoprotol, the actual delivery is included under Intervention 25 Essential Delivery Care.

Population in Need:
About 5% of pregnancies go beyond 41 weeks.

Possible Delivery Channels:
Health center/hospital – default setting 50%/50%.

Drugs and Supplies required Per Woman:
25 micrograms of misoprostol orally (which can be repeated 2 hourly to a maximum of 8 doses if indicated), or a 3 mg tablet of prostaglandin E2 vaginally (which can be repeated in 6 hours, according to routine departmental protocol).

Apart from easier administration, oral misoprostol has the advantage of an exact dose preparation. The 25 microg vaginal dose is usually prepared by cutting the 100 microg tablet into four sections. It is also possible to dissolve 200microgram misoprostol in 200ml tap water and give 25ml 2 hourly.

Personnel Time Required per Case:
20 minutes for assessment by an obstetrician/doctor . After administration of misoprotol, 40 minutes additional monitoring by a nurse.

Intervention 25: Labor and Delivery Management/Essential care for all women and immediate essential newborn care – Facility-Based Deliveries

Definition:
- Monitoring of labour progress (partograph), detection of complications , infection control (clean delivery).
- Immediate drying and skin-to-skin contact, early breastfeeding initiation

Population in Need:
All women are assumed to require skilled delivery.
This intervention captures only those women that deliver at a facility. Home-based deliveries are captured by intervention 32.

Possible Delivery Channels
By definition, this intervention is delivered at facility level. Default assumption: 50% clinic, 50% hospital.

Drugs and Supplies required Per Woman:
Drugs and supplies currently costed in the model (does not include active management of third stage of labor which is costed as a separate intervention no. 26)

Drug/Supply	% receiving	Note	Number	Times per day	Days per Case	Units per Case
Clean delivery						
Gloves, surgeon's, latex, disposable, sterile, pair	100%	Examination	1	4	1	4
Povidone iodine, solution, 10%	100%	Antiseptic	1	1	1	1
Clean delivery kit	100%	Soap, plastic sheeting, razor blade, umbilical tape, cotton wrap for newborn	1	1	1	1
Paracetamol, tablet, 500 mg	100%	Pain management after delivery	1	4	3	12
Partograph	100%	Form to monitor progress of labor	1	1	1	1
Delivery record	100%	Delivery record for clinic	1	1	1	1

No specific drugs for routine newborn care

Personnel Time Required per Case:
The model currently assumes the following personnel requirements
For normal deliveries: 6 hours of a midwife's time, 30 minutes of an obstetrician's

Other Costs:
1 night hospitalization for all women

Intervention 26: Active management of third stage of labour (AMTSL)

Definition:
- Controlled cord traction
- Oxytocics
- Massage

Population in Need:
All women delivering at health facilities

Possible Delivery Levels:
Clinic and hospital level (distribution will depend on where women typically deliver in a country). Default 75% clinic, 25% hospital.

Drugs and Supplies as well as Personnel Requirements Per Woman:

Drug/Supply	% receiving	Note	Number	Times per day	Days per Case	Units per Case
Oxytocin, injection, 10 IU in 1 ml ampoule	100%	To induce contraction of uterus, IM	1	1	1	1
Syringe, needle+ swab	100%	For oxytocin injection after delivery	1	1	1	1

Personnel Time Required per Case:
The model currently assumes the following personnel requirements
For normal deliveries: 2 minutes of a midwife's time.

Intervention 27: Pre-Referral Management of Labor Complications

Definition:
Women in labor presenting at lower –level health facilities with complications that require referral to a hospital

Population in Need:
It is assumed that about 5% of deliveries develop complications that cannot be handled at a health center.

Possible Delivery Channels:
Health center.

Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	Gloves	1	2	1	2
Povidone iodine, solution, 10%	50%	Antiseptic	1	1	1	1
Cotton swab	50%	To apply antiseptic	1	1	1	1
IV giving/infusion set, with needle	100%		1	1	1	1
Cannula, IV, 18G, sterile, disposable	100%		1	1	1	1
If shock, hypertension or heavy bleeding						
Sodium lactate (Ringer) + set, 500ml	100%	Infuse 1 liter in 15-20 minutes, then 1 liter in 30 minutes	4	1	1	4
Catheter, Foley, Ch 14	100%	To monitor urine output	1	1	1	1
Bag, urine, 2000ml	100%	To monitor urine output	1	1	1	1
If heavy bleeding						
Oxytocin, injection, 10 IU in 1 ml ampoule	30%	10 units IV	1	1	1	1
Diazepam, injection, 5mg/ml, in 2-ml ampoule	15%	Sedation for manual removal of placenta	1	1	1	1
Oxytocin, injection, 10 IU in 1 ml	15%	After manual removal of	1	1	1	1

ampoule		placenta				
Ampicillin, powder for injection, 500mg, vial	15%	2g IV	4	1	1	4
Gauze pad, 76 x 76 mm, sterile	30%	Dressing	4	1	1	4
If severe pre-eclampsia or eclampsia						
Sodium lactate (Ringer) + set, 500ml	20%	1 liter in 6-8 hours	4	1	1	4
Hydralazine, 20 mg/ml, ampoule 1 ml	100%	For hypertension, 5mg IV or IM, repeat every 30 minutes as needed (max. 20mg)	1	1	1	1
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	4g (20ml of 20% solution) IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	In addition, 10g (10ml of 50% solution) as deep IM injection, 5g into each buttocks	1	1	1	1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	20%	For IM injection, 1ml, in same syringe as magnesium sulfate	1	1	1	1
Syringe, disposable, 10 ml, without needle	20%	For magnesium sulfate IM injections	1	1	1	1
Needle, 21G, disposable	20%	For injection	1	1	1	1
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	If convulsions recur, after 15 minutes give 2g IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10%	Continue if woman is in late labour or referral delayed for long - 5g in altenate buttocks every 4 hours until 24 hours after birth	1	12	1	12
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	10%	For IM injection, 1ml, in same syringe as magnesium sulfate, also repeat every 4 hours	1	12	1	12
Antibiotics						
Ampicillin, powder for injection, 500mg, vial	100%	2g IV every 6 hours until fever-free for 48 hours	4	4	4	64
Water for injection, 10 ml ampoule	100%	For ampicillin	4	4	4	64
Gentamycin, injection, 40 mg (as sulfate)/ml in 2-ml vial	100%	80mg IM every 8 hours	1	4	3	12
Syringe, disposable, 5 ml, without needle	100%	For gentamycin injection	1	4	3	12
Needle, 21G, disposable	100%	For gentamycin injection	1	4	3	12
Metronidazole, injection, 500 mg in 100 ml vial	100%	500mg IV every 8 hours	1	3	4	12
Transportation Costs to Referral Facility						
Travel cost to referral facility - woman	100%	Transportation cost to referral facility	1	1	1	1
Travel cost to referral facility - accompanying medical staff	100%	Transportation to referral facility and back, gasoline, food, if necessary overnight stay, etc.	1	1	1	1

Personnel Time Required per Case:
10 hours of a nurse's/midwife's time (assumption that nurse will accompany the women to referral facility)

Intervention 28: Obstructed Labor

Definition:

Population in Need:

It is assumed that about 10% of women will require Assisted Vaginal Delivery and 90% a C-section.

Possible Delivery Channels:
Default setting: 100% hospital.

Drugs and Supplies required Per Woman:
1. C-Section

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatme units p case/ episo
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	Gloves	1	4	1	
Spinal anesthesia						
Sodium lactate (Ringer) + set, 500ml	50%	To preload and avoid hypotension	2	1	1	
IV giving/infusion set, with needle	50%	for drip during surgery	1	1	1	
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	50%	spinal anaesthesia	1	1	1	
Syringe, disposable, 2 ml, without needle	50%	for liodocain injection	1	1	1	
Needle, spinal, 22G, sterilizable, with stylet, stainless steel	50%	for liodocain injection	1	1	1	
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule	25%	Adrenaline, 0.25ml, if anest. > 45 min	0.5	1	1	
And if necessary						
Epinephrine, injection, 1 mg (as hydrochloride) in 1ml ampoule	10%	If low blood pressure, 0.2mg/kg	1	1	1	
Syringe, disposable, 5 ml, without needle	10%	for epinephrine injection	1	1	1	
Needle, 21G, disposable	10%	for epinephrine injection	1	1	1	
General anesthesia						
Ketamine, injection, 50 mg (as hydrochloride)/ml in 10ml vial	50%		1	1	1	
Syringe, disposable, 10 ml, without needle	50%	for ketamine injection	1	1	1	
Needle, 21G, disposable	50%	for ketamine injection	1	1	1	
OR						
Halothane, Liquid, Inhaler, 1 Bottle (250ml)	0%	general anaesthesia	1	1	1	
Sodium lactate (Ringer) + set, 500ml	50%	IV drip during surgery	2	1	1	
IV giving/infusion set, with needle	50%	for drip during surgery	1	1	1	
Atropine, injection, 1 mg, (sulfate) in 1-ml ampoule	50%	anti muscarinic drug	1	1	1	
Syringe, disposable, 5 ml, without needle	50%	for atropine injection	1	1	1	
Needle, 21G, disposable	50%	for atropine injection	1	1	1	
Prophylactic antibiotics						
Ampicillin, powder for injection, 500mg, vial	100%	antibiotics prophylaxis, 2G IV	4	1	1	

OR						
Cefazolin, ampoule, 500 mg	0%	antibiotics prophylaxis, 1g IV	2	1	1	
Other						
Catheter, Foley, Ch 14	100%	Monitoring of urine output	1	1	1	
Bag, urine, 2000ml	100%	Urine collection	1	1	1	
Procedure						
Povidone iodine, solution, 10%	100%	Antiseptic	1	1	1	
Blade, surgical, no. 22, sterile, disposable	100%		1	1	1	
Needle, suture, assorted sizes, round body	100%	interior and exterior suture	3	1	1	
Suture, catgut, chromic, 1, 150 cm	100%	Repair uterine incision	1	1	1	
Suture, catgut, chromic, 1, 150 cm	100%	To close fascia	1	1	1	
Suture, synthetic, non-absorbable, 3/0, braided polyester, 150cm	100%	To close skin	1	1	1	
Gauze pad, 76 x 76 mm, sterile	100%	Dressing of the incision	5	1	1	
If signs of infection						
IV giving/infusion set, with needle	25%		1	1	1	
Sodium chloride, injectable solution, 0,9% isotonic, 500ml	25%	Shock/IV fluid for antibiotics	1	2	4	
Ampicillin, powder for injection, 500mg, vial	25%	2g IV every 6 hours until fever-free for 48 hours	4	4	4	
Gentamycin, injection, 40 mg (as sulfate)/ml in 2-ml vial	25%	5mg/kg body weight IV every 24 hours	7	1	4	
Metronidazole, injection, 500 mg in 100 ml vial	25%	500mg IV every 8 hours	1	3	4	
After delivery						
Pethidine, HCl 50 mg/ml, 2 ml	100%	Pain management after C-section	1	1	1	
Syringe, disposable, 10 ml, without needle	100%	for pethidine injection	1	1	1	
Needle, 21G, disposable	100%	for pethidine injection	1	1	1	
Sodium lactate (Ringer) + set, 500ml	100%	IV drip during surgery	2	1	1	
Oxytocin, injection, 10 IU in 1 ml ampoule	100%	20 units over 2 hours	2	1	1	
IV giving/infusion set, with needle	100%	for drip during surgery	1	1	1	
Paracetamol, tablet, 500 mg	100%	Pain management	1	4	3	

2. AVD

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Gloves, surgeon's, latex, size 7-1/2, disposable, sterile, pair	100%	Gloves	1	4	1	4

Povidone iodine, solution, 10%	100%	Antiseptic	1	1	1	1
Cotton swab	100%	To apply antiseptic	1	1	1	1
Clean delivery kit	100%	Soap, plastic sheeting, razor blade, umbilical tape, cotton wrap for newborn	1	1	1	1
Oxytocin, injection, 10 IU in 1 ml ampoule	100%	To induce contraction of uterus, IM	1	1	1	1
Syringe, disposable, 5 ml, with needle	100%	For oxytocin injection after delivery	1	1	1	1
Paracetamol, tablet, 500 mg	100%	Pain management after delivery	1	4	3	12
Episiotomy or Tears						
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	100%	Local anaesthesia for episiotomy/repair of tears	1	1	1	1
Syringe, disposable, 10 ml, with needle	100%	For lidocaine injection	1	1	1	1
Needle, suture, assorted sizes, cutting	100%	Suture of episiotomy or tear	1	1	1	1
Suture, catgut, chromic, 3/0, 150 cm	100%	Suture of episiotomy or tear	1	1	1	1
Gauze pad, 76 x 76 mm, sterile	100%	Dressing for episiotomy/tears	1	1	1	1
After delivery						
Pethidine, HCl 50 mg/ml, 2 ml	50%	Pain management after delivery	1	1	1	1
Syringe, disposable, 10 ml, without needle	50%	For pethidine injection	1	1	1	1
Needle, 21G, disposable	50%	For pethidine injection	1	1	1	1
Other						
Paracetamol, tablet, 500 mg	100%	Pain management	1	4	3	12

Personnel Time Required per Case:
C-section: ObGyn 90 minutes, nurse 90 minutes assistance during procedure + 30 minutes a day during 7-day hospital stay
AVD: Doctor/ObGyn 30 minutes, nurse 30 minutes

Intervention 29: Magnesium-Sulphate Management of Eclampsia

Definition:
Eclampsia: convulsions occurring ante-, intra- or postpartum, associated with high blood pressure and proteinuria

Population in Need:
2.3% of all pre-eclampsia cases for developing countries, 0.8% for developed

	Pre-eclampsia as % of births	Eclampsia (as % of pre-eclampsia)
AFR D	2.8	2.3
AFR E	2.8	2.3
AMR A	0.4	0.8
AMR B	2.8	2.3
AMR D	2.8	2.3
EMR B	2.8	2.3
EMR D	2.8	2.3
EUR A	0.4	0.8
EUR B	2.8	2.3
EUR B	2.8	2.3
EUR C	2.8	2.3
SEAR B	2.8	2.3
SEAR D	2.8	2.3
WPR A	0.4	0.8
WPR B	2.8	2.3

Source: Doulea, AbouZhar. 2003. Global burden of hypertensive disorders of pregnancy in the year 2000 http://www.who.int/healthinfo/statistics/bod_hypertensivedisordersofpregnancy.pdf

Possible Delivery Channels:
Defaults setting: 50% health center, 50% hospital

Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Test strips, urinary protein	100%	Urine test	1	1	1	1
Catheter, Foley, Ch 14	100%	Control of urine output	1	1	1	1
Bag, urine, 2000ml	100%	Urine collection	1	1	1	1
High Blood Pressure (if diastolic BP > 110mmHg)						
IV giving/infusion set, with needle	100%	For drip	1	1	1	1
Sodium lactate (Ringer) + set, 500ml	100%	IV drip	1	1	1	1
Hydralazine, 20 mg/ml, ampoule 1 ml	100%	5mg IV or IM, repeat every 30 minutes as needed (max. 20mg)	1	1	1	1
Convulsions						
Sodium lactate (Ringer) + set, 500ml	20%	1 liter in 6-8 hours	4	1	1	4
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	4g (20ml of 20% solution) IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	In addition, 10g (10ml of 50% solution) as deep IM injection, 5g into each buttocks	1	1	1	1
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	20%	For IM injection, 1ml, in same syringe as magnesium sulfate	1	1	1	1
Syringe, disposable, 10 ml, without needle	20%	For magnesium sulfate IM injections	1	1	1	1
Needle, 21G, disposable	20%	For injection	1	1	1	1
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20%	If convulsions recur, after 15 minutes give 2g IV over 20 minutes	1	1	1	1
Water for injection, 10 ml ampoule	20%	To create 20% magnesium sulphate solution	2	1	1	2
Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10%	Continue if woman is in late labour or referral delayed for long - 5g in altenate buttocks every 4 hours until 24 hours after birth	1	12	1	12
Lidocaine HCl (in dextrose 7.5%), ampoule 2ml	10%	For IM injection, 1ml, in same syringe as magnesium sulfate, also repeat every 4 hours	1	12	1	12

Personnel Time Required per Case:
6 hours day1; 3 hours/day from day 2 to day 7

Hospitalization:
7 days

Intervention 30: Newborn resuscitation (clinic-based deliveries)

Definition:
Detection of breathing problems and resuscitation of newborn when required

Population in Need:
WHO assumption 1% of all newborns will require resuscitation (same rate for facility and home-births0

Possible Delivery Channels:
Assumed to take place where deliveries take place. (intervention 15 for clinic-based, 21 for home-based deliveries)

Drugs and Supplies required Per Newborn:
Equipment required: bag and mask, cost of equipment ($90) divided by average caseload of midwife (200 births per year - Joy)

(Disposable mucus extractor for home deliveries)

Personnel Time Required per Case:
Doctor: 20 minutes
Midwife / nurse: 20 minutes

Intervention 31: Newborn – Treatment of local infections

Definition:
Conjunctivitis, infection of the umbilical stump and other local infections.

Population in Need:
It is assumed that about 10% of newborns will develop some type of local infection.

Possible Delivery Channels:
100% clinic/health center.

Drugs and Supplies required Per Newborn:

Drug/Supply	% receiving	Note	Number	Times per day	Days per Case	Units per Case
Local infection (skin pustules, umbilical and eye infections)						
Gloves, examination, latex, non-sterile	100%		1	2	3	6
Gentian violet	50%	Skin pustules or umbilical infection	1	1	1	1
Tetracycline, eye ointment, 1% (hydrochloride)	50%	Treatment of eye infection	0.2	3	3	2

Personnel Time Required per Newborn:
10 minutes of a nurse's time + 5 minute for follow-up visit.
Source: WHO. 2003. Pregnancy, Childbirth, Postpartum and Newborn Care:

Intervention 32: Kangaroo Mother Care

Definition:
Kangaroo mother care (KMC), defined as skin-to-skin contact between a mother and her newborn, frequent and exclusive or nearly exclusive breastfeeding, and early discharge from hospital, has been proposed as an alternative to conventional neonatal care for low birthweight (LBW) infants.

Population in Need:
All LBW births (delivered at facility level).
Source: UNICEF Global Database, http://www.childinfo.org/low_birthweight_table.php, accessed Aug 2011

Possible Delivery Channels:
Requires inpatient care/beds. Delivery thus limited to hospitals and clinics with beds.
Default assumption in model based on location where facility-based deliveries take place (50% clinic, 50% hospital)

Drugs and Supplies required Per Case:
None.

Personnel Time Required per Case:
Nurse/midwife 30 minutes.

Intervention 33: Clean Birth Practices (Home Birth)

Definition:
Use of clean delivery kit, and promotion of clean cord care practices for those who deliver outside facility.

Population in Need:
100% of all newborns delivered at home/outside of a health facility would benefit from this intervention.

Possible Delivery Channels:
Community level.

Drugs and Supplies required Per Case:
UNFPA Clean Delivery Kit (includes s)oap, plastic sheeting, razor blade, umbilical tape, cotton wrap for newborn) and estimated to cost $1.37 per kit.

Personnel Time Required per Case:
Assumption that person assisting the women during the delivery is not a paid health staff.

Intervention 34: Newborn resuscitation (home-based deliveries)

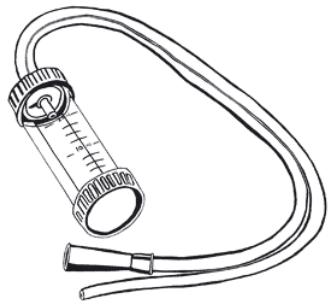
Definition:
Detection of breathing problems and resuscitation of newborn when required

Population in Need:
WHO assumption: 1% of all newborns requiring this intervention

Delivery Level:
Community level

Drugs and Supplies required Per Newborn:
Mucus extractor ($0.96)

Personnel Time Required per Case:
Assumption that person assisting the women during the delivery is not a paid health staff.



Intervention 35: Postnatal preventive care

Definition:
Assessment of maternal and neonatal wellbeing
a) Mother:
• Prevention and detection of complications (e.g. infections, bleeding, anaemia)
• Anaemia prevention and control (iron and folic acid supplementation)
• Information and counselling on nutrition, safe sex, family planning and provision of some contraceptive methods

- Postnatal care planning, advice on danger signs and emergency preparedness
- Provision of contraceptive methods, if desired

b) Newborn:
- Routine postnatal care for all babies: promotion and support of breastfeeding, cord care, thermal care, detection of illness and extra care for LBW infants.
- Children delivered at home may be seen by a community level health worker (4 visits).
- Children delivered in a facility often receive their first check-up at facility level, followed by continued facility care or by 3 home visits at community level.

Population in Need:
All women and newborns are assumed to need this intervention after delivery (either at home or in a facility).

Possible Delivery Channels:
Default setting: 50% outreach, 50% clinic/health center level.
Other setups possible (see below)

Potential Delivery Strategies for Postnatal Care

	Possible strategies for post-natal care contact	Mother-friendly	Provider-friendly	Implementation challenges
1	Mother and baby go to facility	*	***	Requires mother to go to the facility within a very short time after birth. More likely following a facility birth, but still challenging in first days after birth.
2	Skilled provider visits the home to provide post-natal care for mother and baby	***	*	Conditional on sufficient human resources, which is challenging. Providing post-natal care may not be highest priority for skilled health personnel in settings where their attendance at birth is still low. Many post-natal care tasks can be delegated to another cadre. A skilled provider may be able to provide home visits during the post-natal period if rural health facilities are quiet during afternoons.
3	Community health worker visits home to see mother and baby	***	*	Requires sufficient numbers of community health workers with adequate training, supervision and incentives.
4	Combination: Facility birth and first post-natal care visit in facility, then home visit within two to three days, with subsequent post-natal care visits at a health facility	**	**	Requires team approach between facility-based and community health workers, sufficient human resources, management and supervision, effective referral systems and an efficient information tracking system so that the progress of the mother and baby is easy to track.

Note: * Low degree. ** Moderate degree. *** High degree

Drugs and Supplies required Per Woman/Newborn:
Drugs and supplies for most items included in other interventions.

Personnel Time Required per Case:
4 x 20 minutes of a nurse/midwife's time

Source: WHO. 1998. Postpartum Care of the Mother and Newborn – A Practical Guide.

Intervention 36: Mastitis

Definition:
Mastitis is an inflammatory condition of the breast, which may or may not be accompanied by infection. It is usually associated with lactation, so it is also called lactational mastitis (67) or puerperal mastitis (1). It can occasionally be fatal if inadequately treated. Mastitis is commonest in the second and third week postpartum (29; 120; 122), with most reports indicating that 74% to 95% of cases occur in the first 12 weeks

The main principles of treatment of mastitis are:
- Supportive counselling
- Effective milk removal
- Antibiotic therapy
- Symptomatic treatment

Population in Need:
Mastitis and breast abscess occur in all populations, whether or not breastfeeding is the norm. The reported incidence varies from a few to 33% of lactating women, but is usually under 10%

Possible Delivery Channels:

	% of cases receiving treatment
Community Level	
Outreach	%
Clinic	50%
Hospital	50%

Drugs and Supplies required Per Woman:
For 10-14 days:

- Erythromycin 250 – 500 mg 6 hourly (included as the default) OR
- Flucloxacillin 250 mg 6 hourly OR
- Dicloxacillin 125-500 mg 6 hourly by mouth
- Amoxacillin 250-500 mg every 8hours
- Cephalexin 250-500 mg 6 hourly (

Personnel Time Required per Case:
20 minutes of a nurse/midwife's time (15 minutes for assessment and treatment and 5 minutes for follow up).

Source: WHO. 2000. Mastitis – Causes and Management. WHO/FCH/CAH/00.13

Intervention 37: Postpartum Hemorrhage

Definition:
Bleeding from the genital tract of 1000 ml or more following the delivery of the baby, within the first 24h, or more than 24h but less than 6 weeks from delivery.

Population in Need:
Table 3.3. Estimated incidence rates for postpartum haemorrhage (per 100 births) by WHO Region

AFRO D	9.7
AFRO E	9.8
AMRO A	6.4
AMRO B	7.0
AMRO D	9.3
EMRO B	7.1
EMRO D	9.7
EURO A	6.4
EURO B	7.1
EURO B	6.8
EURO C	6.4
SEARO B	8.6
SEARO D	10.5
WPRO A	6.3
WPRO B	8.1
WPRO B	9.0
WPRO B	8.6

Source: http://www.who.int/healthinfo/statistics/bod_maternalhaemorrhage.pdf

Possible Delivery Channels:
Default setting: 100% hospital
Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Gloves, surgeon's, latex, size 6-1/2, disposable, sterile, pair	100%	Gloves	1	4	1	4
Oxytocin, injection, 10 IU in 1 ml ampoule	100%	10 units IM	1	1	1	1
Syringe, disposable, 10 ml, without needle	100%	For oxytocin injection	1	1	1	1
Needle, 21G, disposable	100%	For oxytocin injection	1	1	1	1
Sodium lactate (Ringer) + set, 500ml	100%	To restore blood volume	2	1	1	2
IV giving/infusion set, with needle	100%	For IV drip	1	1	1	1
Blood, one unit	25%	Blood transfusion in case of heavy blood loss	2	1	1	2
Catheter, Foley, Ch 12	100%	Control of urine output	1	1	1	1
Bag, urine, 2000ml	100%	Urine collection	1	1	1	1
Atonic Uterus						
Oxytocin, injection, 10 IU in 1 ml ampoule	50%	20 units in 1 liter IV fluid	2	3	1	6
Sodium lactate (Ringer) + set, 500ml	50%	To restore blood volume, not more than 3 liters	2	3	1	6
Repair of Tears and Lacerations						
Povidone iodine, solution, 10%	50%	Antiseptic	1	1	1	1
Cotton swab	50%	To apply antiseptic	1	1	1	1
Diazepam, injection, 5mg/ml, in 2-ml ampoule	50%	Sedation	1	1	1	1
Lidocaine, injection, 1% in 20 ml vial	50%	Local anesthesia	1	1	1	1
Syringe, disposable, 20 ml, without needle	50%	for lidocaine injection	1	1	1	1
Needle, 21G, disposable	50%	for lidocaine injection	1	1	1	1
Pethidine, HCl 50 mg/ml, 2 ml	50%	Local anesthesia	1	1	1	1
Syringe, disposable, 10 ml, without needle	50%	for pethidine injection	1	1	1	1
Needle, 21G, disposable	50%	for pethidine injection	1	1	1	1
Needle, suture, assorted sizes, round body	50%	Repair of tears and lacerations	3	1	1	3
Suture, catgut, chromic, 1, 150 cm	50%	Repair of tears and lacerations	2	1	1	2
Suture, synthetic, non-absorbable, 2/0, braided polyester,	50%	Repair of tears and lacerations	1	1	1	1
If there are signs of infection						
IV giving/infusion set, with needle	10%		1	1	1	1
Sodium chloride, injectable solution, 0,9% isotonic, 500ml	10%	Shock/IV fluid for antibiotics	1	2	4	8
Ampicillin, powder for injection, 500mg, vial	10%	2g IV every 6 hours until fever-free for 48 hours	4	4	4	64
Water for injection, 5 ml ampoule	10%	For ampicillin	4	4	4	64
Gentamycin, injection, 40 mg (as sulfate)/ml in 2-ml vial	10%	80mg IM every 8 hours	1	4	3	12
Metronidazole, injection, 500 mg in 100 ml vial	10%	500mg IV every 8 hours	1	3	4	12
After bleeding is controlled						
Lancet, blood, disposable	100%	To take blood sample	1	1	1	1
Test, hemoglobin	100%	To test hemoglobin level	1	1	1	1
Albendazole, tablet 400mg	25%	endemic	1	1	1	1
a) If HB < 7g/dL (severe anemia)						
Ferrous Salt + Folic Acid, tablet, 200+0.25 mg (60mg iron)	25%	First 3 months	2	1	90	180
Ferrous Salt + Folic Acid, tablet, 200+0.25 mg (60mg iron)	25%	Following 6 months	1	1	180	180
a) If HB between 7-11g/dL						
Ferrous Salt + Folic Acid, tablet, 200+0.25 mg (60mg iron)	75%	For 6 months	1	1	180	180

Personnel Time Required per Case:

Type of Staff	% treated by this type of staff	Note	Minutes	Times per Day	No. of Days/ Visits	Total No. of Minutes
Auxiliary/Attendant	50%	During hospitalization, 30 minutes a day	30	1	4	120
Nurse/Midwife	100%	Management of shock (IV fluids)	60	1	1	60
Obstetrician	100%	Oxytocin, removal of placenta, repair of vaginal/perinal/cervical tears	90	1	1	90
Anaesthesist	100%		60	1	1	60
Lab Technician	100%	Lab tests	15	1	1	15

Hospitalization:

5 days (average)

Intervention 38: Maternal sepsis management

Definition:

- Infection of the genital tract occurring at any time between the rupture of membranes or labour, and the 42nd day postpartum in which 2 or more of the following are present:
  - Pelvic pain
  - Fever i.e. oral temperature 38.5°C or higher on any occasion
  - Abnormal vaginal discharge, e.g. presence of pus
  - Abnormal smell/foul odour of discharge
  - Delay in the rate of reduction of the size of the uterus (<2cm/day during the first 8 days)

Source: http://www.who.int/healthinfo/statistics/bod_maternalsepsis.pdf

Population in Need:

All women who experience sepsis symptoms within 42 days of delivery.

Table 3.3. Data and assumptions used to estimate regional incidence rates for puerperal sepsis

WHO region	Proportion of deliveries with skilled birth attendance (per 100 live births)	Estimated C-section rate per 100 live births	Antibiotic prophylaxis coverage per 100 C-section births	Estimated incidence rate per 100 live births
AFRO D	46	4.2	20	4.1
AFRO E	45	4.2	20	4.1
AMRO A	99	10.2	80	2.7
AMRO B	89	26.1	50	3.7
AMRO D	52	26.1	20	5.2
EMRO B	87	10.0	50	3.2
EMRO D	47	8.5	20	4.3
EURO A	99	10.2	80	2.7
EURO B1	87	10.2	50	3.2
EURO B2	93	10.2	50	3.1
EURO C	99	10.2	50	2.9
SEARO B	64	7.3	50	3.7
SEARO D	34	5.8	20	4.5
WPRO A	100	10.2	80	2.7
WPRO B1	72	7.3	50	3.5
WPRO B2	57	7.3	50	3.8
WPRO B3	64	7.3%	50	3.7

Possible Delivery Channels:

Default setting: 50% clinic, 50% hospital.

Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case/ episode	Treatment units per case/ episode
Antibiotics						
Gloves, surgeon's, latex, size 6-1/2, disposable, sterile, pair	100%	Gloves	1	1	1	1
Ampicillin, powder for injection, 500mg, vial	100%	2g IV every 6 hours until fever-free for 48 hours	4	4	4	64
Water for injection, 5 ml ampoule	100%	For ampicillin	4	4	4	64
Gentamycin, injection, 40 mg (as sulfate)/ml in 2-ml vial	100%	80mg IM every 8 hours	1	4	3	12
Syringe, disposable, 5 ml, without needle	100%	For gentamycin injection	1	4	3	12
Needle, 21G, disposable	100%	For gentamycin	1	4	3	12

		injection				
Metronidazole, injection, 500 mg in 100 ml vial	100%	500mg IV every 8 hours	1	3	4	12
Sodium chloride, injectable solution, 0,9% isotonic, 500ml	100%	Shock/IV fluid for antibiotics, 1 liter in 6-8 hours	2	3	4	24
IV giving/infusion set, with needle	100%		1	1	1	1
Amoxicillin, tablet, 500 mg (anhydrous)	100%	500mg 3 times daily until 7 days of treatment completed	1	3	3	9
Lancet, blood, disposable	100%	To take blood for complete blood count	1	1	1	1
Complete blood count	100%	Blood Count	1	1	1	1
Catheter, Foley, Ch 12	100%	Control of urine output	1	1	1	1
Bag, urine, 2000ml	100%	Urine collection	1	1	1	1
Oxygen, inhalation (medicinal gas)	25%	Shock: Oxygen 3 hours at 6-8 liters/min (1500 liters)	15	1	1	15
Other						
Paracetamol, tablet, 500 mg	100%	Pain management	1	4	2	8

Personnel Time Required per Case:
1 hours of a nurse's time, 30 minutes a day of an auxiliary's time during hospitalization (5 days)
30 minutes of a lab technician's time

Hospitalization:
4 days on average)

Intervention 39: Newborn Sepsis - Injectable Antibiotics

Definition:
Administration of intramuscular antibiotics for neonatal sepsis, meningitis, or pneumonia

Population in Need:
Based on a review of studies, the incidence of clinically diagnosed neonatal sepsis ranged from 49 per 1000 live births in babies older than 24 hours of life in rural Guatemala to as high as 170 per 1000 live births detected by village healt workers in rural India. The default setting used in the model is 100 per 1,000 live birth. It is expected that 90% of them can be treated with injectable antibiotics, 10% will require full supportive care.
Source: Thaver, Durrane; Zaidi, Anita K. M. Burden of Neonatal Infections in Developing Countries: A Review of Evidence From Community-Based Studies Pediatric Infectious Disease Journal. 28(1):S3-S9, January 2009.

Possible Delivery Channels:
Default setting: 100% clinic.

Drugs and Supplies required Per Newborn:

Drug/Supply	% receiving	Note	Number	Times per day	Days per Case	Units per Case
Procaine benzyl penicillin, powder for injection, 1 g (= 1 million IU) in vial	100%		1	1	1	1
Gentamicin inj 40mg/ml 2ml amp	100%		1	1	5	5

Personnel Time Required per Newborn:
Nurse: 40 minutes a day for 7 days

Intervention 40: Newborn Sepsis - Full Supportive Care

Definition:
Hospital-based management of sick newborn as an inpatient with supportive care

- Administration of intravenous antibiotics
  - ○ Wider choice of antibiotics including broad spectrum antibiotics
  - ○ Option of using frequent/higher dosage if needed to maintain high blood antibiotic levels or coverage for meningitis,
  - ○ Access to second-line antibiotic therapy for neonates with treatment failure on first line antibiotics
- Intravenous access and administration of intravenous fluids if needed
- Oxygen supplementation if required
- Access to appropriate diagnostic procedures, such as monitoringof pulse, blood pressure, and oximetry reading, as well asmonitoring/correction of hypoglycemia if required

Population in Need:
See intervention 38. The default setting used in the model is 100 per 1,000 live birth. It is expected that 10% of these newborns will require full supportive care.
Source: Thaver, Durrane; Zaidi, Anita K. M. Burden of Neonatal Infections in Developing Countries: A Review of Evidence From Community-Based Studies Pediatric Infectious Disease Journal. 28(1):S3-S9, January 2009.

Possible Delivery Channels:
100% hospital.

Drugs and Supplies required Per Newborn:

Drug/Supply	% receiving	Note	Number	Times per day	Days per Case	Units per Case
Ampicillin powder for syrup, 125mg	100%		1	2	5	10
Cephalotin, 100ml vial	30%		1	2	2	4
Gentamicin inj 40mg/ml 2ml amp	100%	outpatient management	1	1	5	5
Lumbar puncture	30%					0
Blood culture	30%					0
IV giving/infusion set, with needle	20%		1	1	1	1
Chest X-ray	0%		1	1	1	1

Personnel Time Required per Newborn:
Doctor 60 minutes a day, nurse 2 hours per day for 10 days.

Intervention 41: Syphilis

Definition:
Screening and treatment of sero-positive cases with penicillin.

Population in Need:
Screening -
Treatment – for those testing positive.

Table C3. Incidence rates for sexually transmitted infections and pelvic inflammatory disease (per thousand individuals 15-49)

	Chlamydia		Gonorrhea		Syphilis		Trichomoniasis	
Region	Females	Males	Females	Males	Females	Males	Females	Males
World	32.7	26.5	22.0	18.1	3.5	4.1	57.3	54.2
Australia & New Zealand	29.1	23.8	10.3	10.2	0.7	0.7	49.7	54.4
East Asia & Pacific	6.8	6.0	4.2	3.8	0.3	0.3	12.3	10.9
Eastern Europe & Central Asia	31.4	26.4	17.5	14.6	0.5	0.5	61.5	65.6
Latin America & Caribbean	37.4	31.2	29.3	24.3	9.4	12.2	64.2	70.8
Mideast & North Africa	16.9	19.0	8.0	8.8	2.0	2.2	27.5	25.0
Northern America	26.9	22.0	10.5	8.9	0.7	0.7	48.6	53.2
sub-Saharan Africa	58.6	55.6	62.9	59.5	12.0	15.6	113.4	117.7
South & Southeast Asia	50.2	37.4	31.6	23.9	3.9	4.3	83.9	71.8
Western Europe	29.5	22.4	6.3	4.8	0.7	0.6	51.0	54.2

Source: Calculated from WHO (2001) in UNFPA Achieving the ICPD Goals. (2004), Table C3.

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Woman:

Description of treatment line	% receiving this treatment	Note	Number	Times per day	Days per case	Treatment units per case
General Treatment for Women (Pregnant and non-pregnant)						
Procaine benzyl penicillin, powder for injection, 1 g (= 1 million IU) in vial	90%	antibiotics	1	1	10	10
Water for injection, 5 ml ampoule	90%	for benzathine benzylpenicillin injection	1	1	10	10
Syringe, disposable, 5 ml, with needle	90%	for benzathine benzylpenicillin injection	1	1	10	10
Condom, standard, male 53 mm	90%	10 condoms	10	1	1	10
a) for penicillin-allergic, non-pregnant Women						
Doxycycline, capsule or tablet, 100 mg (hydrochloride)	5%	antibiotics	1	2	14	28
Condom, standard, male 49 mm	5%	10 condoms	10	1	1	10
c) for penicillin-allergic, pregnant Women						
Erythromycin, tablet or capsule, 250 mg	5%	antibiotics	2	4	14	112
Condom, standard, male 53 mm	5%	10 condoms	10	1	1	10
General Treatment for Men						
Procaine benzyl penicillin, powder for injection, 1 g (= 1 million IU) in vial	90%	antibiotics	1	1	10	10
Water for injection, 5 ml ampoule	90%	for benzathine benzylpenicillin injection	1	1	10	10
Syringe, disposable, 5 ml, with needle	90%	for benzathine benzylpenicillin injection	1	1	10	10
Condom, standard, male 53 mm	90%	10 condoms	10	1	1	10
b) for penicillin-allergic Men						
Tetracycline, capsule or tablet 250 mg (hydrochloride)	10%	antibiotics	2	4	14	112
Condom, standard, male 53 mm	10%	10 condoms	10	1	1	10

Personnel Time Required per Case:
2 x 5 minutes of a nurse's time (5 minutes for screening and 5 minutes for follow up)

Source: WHO. 2003. Guidelines for the Management of Sexually Transmitted Infections, p. 43

Intervention 42: Gonorrhea

Definition:
Gonorrhea is the inflammation of the mucous membranes of the urogenital tract, throat or rectum. It is caused by the gonococcus bacterium, Neisseria gonorrhoeae. Short-term effects in women include vaginal discharge, bleeding between and during menstrual periods, painful urination, painful intercourse and lower abdominal pain. Complications in women include pelvic infection leading to infertility, ectopic pregnancy, chronic pelvic inflammatory disease and chronic pelvic. In men, complications include urethral strictures. In both sexes, septicaemia, arthritis, endocarditis and meningitis and in newborn infants, eye infection which can lead to blindness. Sophisticated equipment is needed for diagnosis which is costly and not always available in developing country laboratories.

Population in Need:
Incidence of gonorrhea

WHO region	Incidence per 1,000 pop 15-49
World	22.0
Australia & New Zealand	10.3
East Asia & Pacific	4.2
Eastern Europe & Central Asia	17.5
Latin America & Caribbean	29.3
Mideast & North Africa	8.0
Northern America	10.5
Sub-Saharan Africa	62.9
South & Southeast Asia	31.6
Western Europe	6.3

Source: Calculated from WHO (2001) in UNFPA Achieving the ICPD Goals. (2004).

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Case:
1 Ciprofloxacin 500mg caplet
Each patient should be also provided with 10 condoms to prevent infection of partner(s) during treatment period.

Personnel Time Required per Case:
10 minutes of a nurse 's or midwife's time.

Intervention 43: Chlamydia

Definition:
Chlamydia is caused by a bacterium called Chlamydia trachomatis. It infects the neck of the womb in women and the tube inside the penis in men. Complications in women include pelvis sepsis leading to abscess formation, chronic and recurrent pelvic inflammatory disease, ectopic pregnancy, infertility and chronic pelvic pain.

Population in Need:

WHO region	Incidence per 1,000 population 15-49
World	32.7
Australia & New Zealand	29.1
East Asia & Pacific	6.8
Eastern Europe & Central Asia	31.4
Latin America & Caribbean	37.4
Mideast & North Africa	16.9
Northern America	26.9
Sub-Saharan Africa	58.6
South & Southeast Asia	50.2
Western Europe	29.5

Source: Calculated from WHO (2001) in Bulatao (2004).

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Case:
Doxycycline HCl 100mg tablet 2x a day for 7 days.
Each patient should be provided with 10 condoms to prevent infection of partner(s) during treatment period.

Personnel Time Required per Case:
10 minutes of a nurse's or midwife's time.

Intervention 44: Trichomoniasis

Definition:
Urogenital trichomonas is a sexually transmitted disease affecting both men and women caused by the flagellate protozoan trichomonas vaginalis. It is rarely reported in females before puberty or after menopause, but is common during the childbearing years and peaks during pregnancy. Patients characteristically present with offensive vaginal discharge and itching or irritation. In women, infection causes vaginitis and cystitis and in men urethritis and prostitis. Infected women or men may also be asymptomatic.

Population in Need:

WHO region	Incidence per 1,000 pop 15-49
World	57.3
Australia & New Zealand	49.7
East Asia & Pacific	12.3
Eastern Europe & Central Asia	61.5
Latin America & Caribbean	64.2
Mideast & North Africa	27.5
Northern America	48.6
Sub-Saharan Africa	113.4
South & Southeast Asia	83.9
Western Europe	51.0

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Case:
The standard treatment for trichomonas infection is metronidazole given as 250 mg three times a day for 7 days. Each patient should also be provided with 10 condoms to prevent infection of partner(s) during treatment period.

Personnel Time Required per Case:
10 minutes of a nurse's or midwife's time.

Intervention 45: PID

Definition:
Pelvic inflammatory disease (PID) is often a consequence of sexually transmitted infection.
It is an infection that spreads from the vagina and cervix and then to the uterus and fallopian tubes. PID can lead to sterility. This syndrome may be caused by gonococcal, chlamydial or anaerobic infection. If an intrauterine device is in place, it should be removed.

Population in Need:
Incidence of pelvic inflammatory disease

WHO region	Incidence per 1,000 pop 15-49
World	112.4
Australia & New Zealand	62.3
East Asia & Pacific	24.7
Eastern Europe & Central Asia	93.2
Latin America & Caribbean	119.1
Mideast & North Africa	59.9
Northern America	60.1
Sub-Saharan Africa	252.5
South & Southeast Asia	168.5
Western Europe	59.1

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Case:
1 Ciprofloxacin 500mg caplet 2x day for 3 weeks
+ Doxycyline HCl 100mg tablet 2x a day for 3 weeks
+ Metronidazole 200mg tablet 2x a day for 3 weeks
Each patient is also provided with 10 condoms to prevent infection of partner(s) during treatment period.

Personnel Time Required per Case:
10 minutes of a nurse's or midwife's time for counseling on condom use and treatment. 5 minutes of doctor's time.

Intervention 46: Urinary Tract Infection (UTI)

Definition:
Urinary tract infection (UTI) is a common infection that usually occurs when bacteria enter the opening of the urethra and multiply in the urinary tract. The urinary tract includes the kidneys, the tubes that carry urine from the kidneys to the bladder (ureters), bladder, and the tube that carries urine from the bladder (urethra). The special connection of the ureters at the bladder help prevent urine from backing up into the kidneys, and the flow of urine through the urethra helps to eliminate bacteria.

Population in Need:
It is estimated that globally 25% of all women suffer from UTI in any year.

Possible Delivery Channels:
Default setting: 50% clinic/50% hospital.

Drugs and Supplies required Per Case:
Amoxicillin, 500mg tablet 3x a day for 3 days ($0.30)

Personnel Time Required per Case:
10 minutes of a nurse 's or midwife's time.

Intervention 47: Cervical Cancer Screening

Definition:

Cervical cancer, cancer of the uterine cervix, is the second most common type of cancer among women, and was responsible for over 250 000 deaths in 2005, approximately 80% of which occurred in developing countries The development of cervical cancer is gradual and begins as a pre-cancerous condition called dysplasia. In this form it is 100% treatable, usually without the need for a hysterectomy.

Conventional Pap smear

In the Pap smear test, a sample of cells is taken from the transformation zone of the cervix using an extended-tip wooden spatula or brush; using a cotton swab is no longer recommended. The entire transformation zone should be sampled since this is where almost all high-grade lesions develop. The sample is then smeared onto a glass slide and immediately fixed with a solution to preserve the cells. The slide is sent to a cytology laboratory where it is stained and examined using a microscope to determine whether the cells are normal (Figure 4.1) and to classify them appropriately, using the Bethesda classification (see Annex 2). The results of the Pap smear are then reported to the clinic where the specimen was taken. Health workers are responsible for ensuring that the woman is informed of her result and that she receives appropriate follow-up as outlined in Annex 4a. The Pap test takes less than 5 minutes to perform, is not painful,

Pap smear

Bethesda system

Source: WHO. 2006. Comprehensive Cervical Cancer Control – A guide to Essential Practice.

Population in Need:

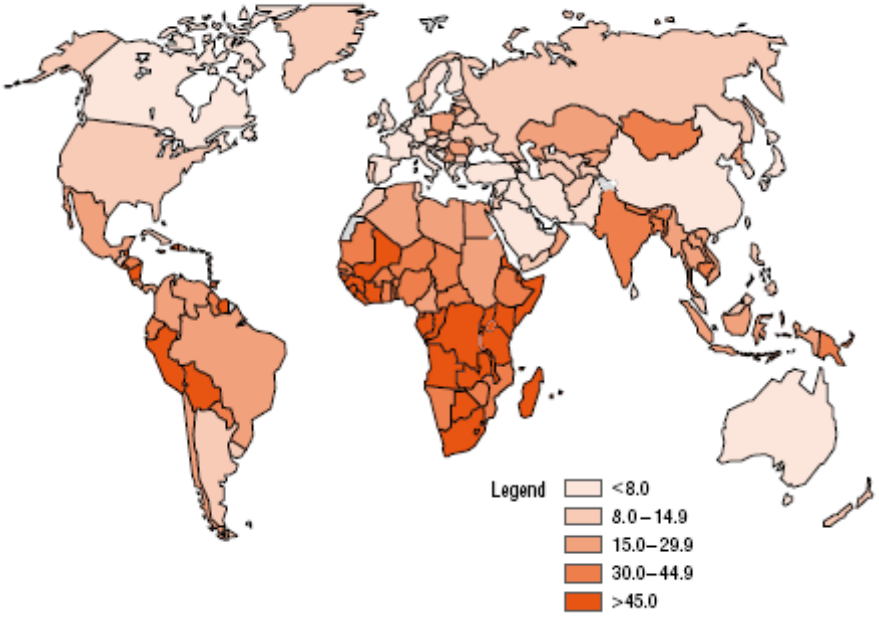
RECOMMENDED TARGET AGES AND FREQUENCY OF CERVICAL CANCER SCREENING

- New programmes should start by screening women aged 30 years or more, and include younger women only when the higher-risk group has been covered. Existing organized programmes should not include women less than 25 years of age in their target populations.
- If a woman can be screened only once in her lifetime, the best age is between 35 and 45 years.
- For women over 50 years, a five-year screening interval is appropriate.
- In the age group 25–49 years, a three-year interval can be considered if resources are available.
- Annual screening is not recommended at any age.
- Screening is not necessary for women over 65 years, provided the last two previous smears were negative.

Model default settings – all women between 25 and 65, screening every 3 year.

Treatment - Incidence: 30 - 50 cases per 100 000 women (treatment not covered in this intervention)

Figure 1.3 Worldwide incidence rates of cervical cancer per 100,000 females (all ages), age-standardised to the WHO standard population (2005)



Possible Delivery Channels:
Default setting: 50% health center, 50% hospital
The sample needs to be sent to a cytology laboratory for analysis.

Drugs and Supplies required Per Case:

The following materials and equipment are needed for taking a conventional Pap smear:

- soap and water for washing hands;
- a light source to examine the cervix;
- an examination table covered by clean paper or cloth;
- a speculum, high-level disinfected (it need not be sterile);
- disposable or high-level disinfected examination gloves;
- an extended-tip wooden or plastic spatula (or another device for sampling);
- a glass slide with frosted edge and pencil for labelling;
- fixative solution;
- recording form;
- small container of warm water to lubricate and warm the speculum;
- 0.5% chlorine solution for decontaminating instruments and gloves.

Gloves, wooden spatula, slide, solution

Personnel Time Required per Case:
All clients attending for screening should have a basic assessment before proceeding to the screening test. This assessment should include information and counseling, informed consent, a social and clinical history and a physical examination. Assumption that most clients will receive this test in the context of another visit (ANC, FP, STI) which already cover many of these activities = time estimate 10 minutes of a nurse's/midwife's time.
Actual screening: 5 minutes
After results are back from the cytology lab, the woman should come in for a follow-up (2 minutes).

Source: WHO. 2006. Comprehensive Cervical Cancer Control – A guide to Essential Practice.

Intervention 48: Clinical breast exam

Definition:
Breast cancer is the top cancer in women both in the developed and the developing world. The incidence of breast cancer is increasing in the developing world due to increase life expectancy, increase urbanization and adoption of western lifestyles. The recommended early detection strategies for low- and middle-income countries are awareness of

early signs and symptoms and screening by clinical breast examination in demonstration areas. Mammography screening is very costly and is only recommended for countries with good health infrastructure that can afford a long-term programme.

Population in Need:
All women above the age of 40.

Possible Delivery Channels:
Default: 100% hospital

Drugs and Supplies required Per Case:
None.

Personnel Time Required per Case:
10 minutes of a ObGyn's time.

Intervention 49: Identification and management of infertility

Definition:

Population in Need:
A more refined measure of the inability to produce offspring is the percentage of women who have not had a fertile pregnancy. A fertile pregnancy is a pregnancy that ended in a live birth or a current pregnancy that is presumed to end in a live birth, on average about 85 percent (Singh, 1989). In columns 3 and 4 of Table 2, the percentages of women without a fertile pregnancy are shown for women 40 to 44 and women 25 to 49, respectively. This measure eliminates the effect of children's mortality on the data.

Table 2
Childlessness and infertility among women age 40-44 and 25-49

Among currently married women age 40-44 and 25-49 who have been married for at least five years, percentage who have no living children and percentage who have had no fertile pregnancies, Demographic and Health Surveys 1994-2000

	No living children		No fertile pregnancies	
Country	Age 40-44	Age 25-49	Age 40-44	Age 25-49
Sub-Saharan Africa				
Benin	3.2	2.3	2.1	1.4
Burkina Faso	1.4	2.2	1.0	1.3
Cameroon	7.3	6.6	3.7	4.4
Central African Rep.	10.5	9.3	7.3	6.4
Chad	4.4	3.4	3.0	2.0
Comoros	5.5	4.2	4.4	3.2
Côte d'Ivoire	3.7	3.8	2.0	2.2
Eritrea	1.2	3.3	0.9	1.8
Ghana	1.1	2.5	0.6	2.0
Guinea	3.0	4.5	1.9	2.6
Kenya	1.5	1.6	1.5	1.3
Madagascar	4.7	4.8	3.3	3.4
Malawi	2.8	3.8	1.6	1.7
Mali	3.3	4.3	1.7	2.5
Mozambique	3.1	6.0	1.9	3.3
Niger	4.4	4.2	2.7	2.4
Nigeria	2.1	9.4	1.8	5.2
Senegal	3.8	2.9	2.1	2.0
Tanzania	2.8	4.0	2.0	2.8
Togo	1.4	2.5	0.9	1.7
Uganda	3.2	4.2	1.9	3.0
Zambia	2.3	3.6	1.5	1.9
Zimbabwe	2.7	2.7	2.3	1.6
North Africa/West Asia				
Egypt	2.8	3.1	2.6	2.7
Jordan	2.4	2.8	2.4	2.7
Morocco	2.0	4.5	1.2	3.7
Turkey	1.8	3.2	1.5	2.8
Yemen	2.5	2.5	2.2	2.1
Central Asia/South and Southeast Asia				
Bangladesh	1.8	6.0	1.1	4.0
Cambodia	2.1	2.0	1.8	1.4
India	2.6	3.1	2.0	2.5
Indonesia	3.7	3.2	2.9	2.6
Kazakhstan	2.0	2.1	2.0	2.0
Kyrgyz Republic	0.5	1.9	0.5	1.5
Nepal	3.2	3.3	1.4	2.2
Philippines	1.6	2.3	1.4	2.0
Turkmenistan	1.3	1.9	1.3	1.5
Uzbekistan	0.9	1.4	0.8	1.2
Vietnam	0.9	1.3	0.8	1.1
Latin America/Caribbean				
Bolivia	1.1	1.2	0.7	0.8
Brazil	3.3	3.7	2.9	3.4
Colombia	2.5	2.9	2.3	2.6
Dominican Republic	3.7	3.2	3.0	2.7
Guatemala	1.7	1.3	1.5	1.1
Haiti	3.9	5.3	2.5	3.4
Nicaragua	1.4	1.8	1.2	1.5
Peru	1.4	1.5	1.3	1.3

Source: Infecundity, infertility, and childlessness in developing countries. Demographic and Health Surveys (DHS) Comparative reports No. 9. http://www.measuredhs.com/pubs/pdf/CR9/CR9.pdf

Possible Delivery Channels:
Hospital 100%.

Drugs and Supplies required Per Case:

Personnel Time Required per Case:

CHILD HEALTH

Intervention 50: Vitamin A supplementation for treatment of xerophthalmia

Definition:
Therapeutic doses of vitamin A for the treatment of xerophthalmia, including night blindness, Bitot's spots, corneal xerosis, corneal ulceration, and keratomalacia.

Population in Need:
All individuals presenting with signs of active xerophthalmia, including night blindness, Bitot's spots, corenal xerosis, corneal ulceration, and keratomalacia.

Possible Delivery Channels:
100% clinic

Drugs and Supplies required:

Young children:

50,000 IU for under six months; 100,000 IU for 6-11 months; 200,000 IU for 12 months and over – all to be given one dose immediately on diagnosis, then another 24 hours later and again at least another 2 weeks later.*

Infants 0-5 months
3 x vitamin A (50,000 IU). Using MSH international drug price indicator at the median unitary price of USD 0.0333/ pill, cost per infant 0-5 months treated for xerophthalmia = USD 0.10.

Infants 6-11 months
3 x vitamin A (100,000 IU). Using S1583015 Retinol 100,000IU soft gel.cps/PaC-500 at USD 7.92, cost per infant 6-11 months treated for xerophthalmia = USD 0.05 USD

Children 12 months or older
3 x vitamin A (200,000 IU). Using S1583000 Retinol 200,000IU soft gel.caps/PaC-500 at USD 10.13, cost per child treated for xerophthalmia = USD 0.06

Personnel time
20 minutes of a nurse's time (10 minutes for initial visit, 2X5 minutes follow-up).

Other costs
Individuals with acute corneal lesions should be referred to a hospital on emergency basis (upon diagnosis of xerophthalmia and giving the first dose of vitamin A) as they present complex treatment problems.

Intervention 51: ORS

Definition:
Management of mild and moderate diarrhea with oral rehydration solution (ORS).

It was estimated that about 80% of cases would be mild (no dehydration) and about 20% would show some dehydration. Treatment of severe diarrhea (required in about 1% of diarrhea cases) is dealt with in a separate intervention (Intervention 53).

Population in Need:
Children 0-59 months x Diarrhea incidence from WHO database (CHCET Tool)
Incidence will decrease with improvements in sanitation, model calculates decrease based on coverage increases of sanitation interventions.

Possible Delivery Channels:
The default assumption is that half of these cases will seek treatment, the other half will be treated at home with increased fluids. It is assumed that half of all the cases seeking treatment will be managed by a CHW and half will be treated at a health facility.

Drugs and Supplies required Per Child:
3 sachets of ORS.

Personnel Time Required per Case:
Based on WHO's CHCET model:
a) at community level – one visit by a community health worker (10 minutes)
b) at facility level - one outpatient visit (nurse 10 minutes)

Intervention 52: Zinc for diarrhea treatment

Definition:
There is a good evidence base for the efficacy of oral zinc tablets in the treatment of diarrhoea (www.who.int/elena/titles/zinc_diarrhoea/en/index.html), although effectiveness has been less easy to scale-up. It must always be used with ORT and continued breast-feeding. One of the challenges is that it must be continued for 10-14 days.

The intervention should be linked to related interventions to prevent or manage diarrhoea, e.g improved water source, use of latrines, and hand washing with soap.

Population in Need:
All young children suffering an episode of diarrhoea, especially those in low and middle-income countries.

Possible Delivery Channels:
The tablets can be delivered through clinics, and increasingly through the private sector, even in low-income countries. Getting adequate quality and quantities to those needing them remains an issue in many countries.

Drugs and Supplies required per child:

Infants 0-6 months
10 mg zinc for 10-14 days per episode. Using S1580020 Zinc 20mg tablets/PAC-100 at USD 1.39 (half tablet as recommended in IMCI) and treatment duration of 14 days, cost per infant per episode = USD 0.10 USD.

Infants and children > 6 months
20 mg zinc for 10-14 days per episode. Using S1580020 Zinc 20mg tablets/PAC-100 at USD 1.39 and treatment duration of 14 days, cost per child per episode = USD 0.19 USD.

Personnel Time Required per Case:
If child has been taken to a clinic, 5 minutes of a nurse's time for two visits

Intervention 53: Antibiotics for dysentery

Definition:
Children with diarrhea presenting with blood in the stool receive a three day course of ciprofloxacin and are re-evaluated after 2 days.

Population in Need:
It is assumed that around 5% of diarrhoea cases need to be treated with antibiotics due to presence of bloody diarrhoea or shigellosis.[3]
Children with diarrhea (as calculated for Intervention 51 and 52) x 5%

Possible Delivery Channels:
At least health center. Default assumption 50% clinic, 50% hospital.

Drugs and Supplies required Per Child:
Ciprofloxacine 2 tablets (250mg) per day for 3 days ($0.19).

Personnel Time Required per Case:
2 x 2 minutes of a nurse's time (initial visit + follow-up). Time estimate assumes that intervention 52 is usually provided in conjunction with Intervention 51 and 52.

Intervention 54: Treatment of severe diarrhea (children)

Definition:
Treatment with IV at hospital level

Population in Need:
It is assumed that around 1% of diarrhoea cases will require treatment for severe diarrhea.

Possible Delivery Channels:
Hospital level

Drugs and Supplies required Per Child:
ORS for 3 days as in-patient + 2 days to take home. Other costs included are IV kit, electrolyte solution (for about 12 hrs), syringe, needle, cotton, and take-home materials with advice on preventing diarrhoea at home.

Personnel Time Required per Case:
Outpatient consultation with Nurse - 10 minutes diagnosis, followed by 3 inpatient days in general ward (doctor3 days x 10 minutes + nurse 3 days x 20 minutes)

Hospital Days:
3 hospital days

Intervention 55: Pneumonia treatment (children)

Definition:
It is assumed that only 50% of children seek care at a health facility for this condition. Children diagnosed as having mild or moderate pneumonia are given oral amoxicillin for 3 days, and paracetamol to treat fever. 10% are assumed to have wheezing and receive salbutamol for 4 days.

Population in Need:
Children 0-5 x Country-specific WHO estimates of pneumonia incidence for under-fives. (CHCET Tool)

Possible Delivery Channels:
Default setup: 50% community level, 50% clinic

Drugs and Supplies required Per Child:
Oral amoxicillin (25 mg/kg) twice daily for 3 days, and on average, 6 doses paracetamol (100 mg tablet). It is assumed that 10% of cases have wheezing and receive salbutamol for 4 days. (A dose of one 2-mg tablet for a child aged 2-11 months and one 2-mg tablet for a child 1-4 years, 3 times per day).

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[3] References: (1) Shigellosis: Report of a Workshop held at ICDDR,B: Centre for Health and Population Research, Dhaka, Bangladesh, on 16-18 February 2004, J Health Population Nutrition 2004. 22(4):445-449, and (2) Guidelines for the control of shigellosis, including epidemics due to Shigella dysenteriae type 1. WHO/FCH/CAH/05.03 (in press).

Personnel Time Required per Case:
At community level, 20 minutes of a CHW's time (10 minutes initial visit + 5 minute for each follow-up).
Clinic level 15 minutes of a nurse's time (10 minutes initial visit and 5 minutes for follow-up visit).

Number of Visits:
At community level - One initial visit and two follow-ups by the community health worker over a period of 5 days
At clinic level – 2 visits (one initial and one-follow-up)

Intervention 56: Treatment of severe pneumonia (children)

Definition:
Standard management of very severe acute respiratory infections at the referral level. Children are hospitalized for an average of five days, during which they are given injectable antibiotics (penicillin or ampicillin). Oxygen will be required by 100% of children. An estimated 50% wheezing receive nebulized salbutamol and an estimated 5% of children with Bronchial Asthma will require treatment with steroids for 4 days. All children at this level are assumed to require a chest X-ray test. Upon discharge, case management is continued at out-patient level for another five days.

Population in Need:
It is assumed that 2 - 3% of all cases of pneumonia in children (will require treatment for severe pneumonia[4]

Possible Delivery Channels:
Hospital level.

Drugs and Supplies required Per Child:
During hospitalization:
- ampicillin 50mg/kg IM every 6 hours for 5 days and
- gentamicin 7.5mg/kg IM once a day for 5 days
- Oxygen (1-2l/min) administered with nasal prongs for about 3 days
- paediatric nasogastric tubes for children who can not drink (about 20% of very severe cases; for 3 days)
- For children needing salbutamol: 2.5mg/4 times a day for 5 days
- For children needing steroids: oral prednisolone 1mg/kg for 3days

After discharge:
- oral amoxicillin 15 mg/kg 3 times/day for 5 days and
- gentamicin IM once a day for 5 days
-

Based on "Pocket Book of Hospital Care for Children, WHO 2005

Personnel Time Required per Case:
Hospital: nurse (1x 10min + 6x5min)/day + medical doctor 10 min/day
outpatient follow up: nurse 10min/day

Hospital Days:
5 inpatient hospital days and 5 outpatient visits.

Intervention 57: Malaria Treatment (children)

Definition:
Diagnosis and treatment with artesunate-based drugs (ACTs).

Population in Need:
Number of cases: All children 0-5 living in malaria-endemic and epidemic areas x no. of episodes per year
Incidence in epidemic areas assumed to be 20% of that in endemic areas.

Data on what percentage of children live in malaria endemic areas + incidence data/annual number of episodes from database in WHO's CHCET Model

Incidence affected by use of ITNs - Assumption that ITN use prevents 50% of cases (Cochrane review)

Previous assumption that only 67% of cases seek care, but with move to ACT one can assume that 100% of cases will seek treatment in the health system (Thom).

[4] *Reference:http://whqlibdoc.who.int/publications/2009/9789241597807_eng.pdf*

Possible Delivery Channels:
100% clinic

Drugs and Supplies required Per Child:
Diagnosis:
Default assumption is that rapid diagnostic tests (RDTs) are used for diagnosis. In some settings, microscopy may be used.

a) RDT, $0.45 (UNICEF)
b) Microscopy, slide + stain, $0.03 (Tom estimate)

It is assumed that more children are tested than end up being diagnosed with malaria, therefore costing for 150% of all malaria cases.

Treatment:
Assuming 100% Artesunate-based treatment. 3 options

1. Artesunate + Amodiaquine
2. Artemeter + Lumefantrine
3. Artesunate + SP

Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case
Diagnosis						
Malaria test kit (RDT)	150	Assumption that some tested will be negative	1	1	1	1
Slide and stain for microscopy	0		1	1	1	1
Treatment						
Artemether + Lumefantrine, tablets, 20+120mg, 6x1 blister	0	2x a day for 3 days	2	1	3	6
Artesunate + Amodiaquine, tablets, 50mg+153mg, 3+3 blister	100	1 tablet each 1x a day for 3 days	1	1	3	3
Artesunate + SP, tablets, 50mg+500mg+25mg, 3+1 blister	0	3 tablets of Arte, 1 of SP	1	1	1	1

Personnel Time Required per Case:
Nurse: 20 minutes (15 minutes for RDT)

Intervention 58: Treatment of severe malaria (children)

Definition:

Population in Need:
It is assumed that around 1% of malaria cases will require treatment for severe malaria

Lower estimate (0.5%) by Arantxa Roca-Feltrer et al. Estimates of the burden of malaria morbidity in Africa in children under the age of 5 years. Tropical Medicine and International Health, vol. 13 no 6 pp 1–13 june 2008
"We estimate that 116 million African children under 5 years of age had a malaria episode in 2000, and 545 000 were admitted to hospital with severe malaria"

Possible Delivery Channels:
Hospital level.

Drugs and Supplies required Per Child:

Drug/Supply	% of severe cases receiving	Note	Number	Times per day	Days per Case	Units per Case
Complicated cases						
Blood, one unit	10%		1	1	1	1
IV giving/infusion set, with needle	80%		1	1	1	1
Quinine, injection, 300mg/ml, 2ml ampoule	50%	10 mg/kg (Quinine sulfate) every 8 hours for 3 days	1	3	3	9
OR						
Artesunate 20mg/ml injection/1ml for IV injection	50%	2.4mg/kg/	1	2 first 24h then 1/d	3	4
Glucose inj 5%, 500ml with giving set	80%		1	1	1	1
Blood glucose level test	100%		1	1	1	1
Blood, liter	10%	Blood transfusion	1	1	1	1
Oxygen	20%	+ nasal prongs (one per child)	1	1	1	1
TOTAL DRUGS AND SUPPLIES						

Personnel Time Required per Case:
Hospital-level: Nurse 20 minutes diagnosis and initial treatment
3 days in general ward – Nurse 20 minutes a day, doctor 10 minutes a day
(CHCET assumptions)

Hospital days:
5 -10 days

Intervention 59: Vitamin A for measles treatment (children)

Definition:
Management of non-complicated measles with vitamin A therapy, and paracetamol in case of fever at the health facility level. It is assumed that 10% of cases will develop severe complicated measles with pneumonia complications and need to be treated at the first referral level (Intervention 59).

Population in Need:
Children 1-59 months (assumption 98% of 0-59)
Incidence depending on coverage with measles vaccine. Assume 3% need.

Possible Delivery Channels:
Default assumption: 100% clinic

Drugs and Supplies required Per Child:
For general measles treatment:
2 Vitamin A therapy doses: the first on diagnosis, the second the next day. Dose varies with age: 50 000 IU (<6 months), 100 000 IU (6-11 months) or 200 000 IU (12 months-5 years).
For measles with pneumonia complications, treatment same as for severe pneumonia (see Intervention 52). Also paracetamol.

Personnel Time Required per Case:
15 minutes of a nurse's time (10 minutes initial visit, 5 minutes follow-up)

Intervention 60: Treatment of severe measles

Definition:

Population in Need:
It is assumed that around 1% of measles cases will require treatment for severe measles.

Possible Delivery Channels:

Hospital level.

Drugs and Supplies required Per Child:

Personnel Time Required per Case:

Severe cases:

Hospital-level: 15 minute nurse for diagnosis and initial treatment

3 days in general ward – Nurse 20 minutes a day, doctor 10 minutes a day

MALARIA

Intervention 61: Insecticide-treated materials

Definition:
Long lasting insecticide treated bed nets (ITNs, with an assumed useful life of 3 years).

Population in Need:
Depends on policy. Entire population or all children 0-5/pregnant women living in malaria-endemic and epidemic areas. Database for 75 countries in WHO's CHCET Model

Possible Delivery Channels:
Long lasting ITNs are assumed to be distributed

a) Through mass distribution (e.g. vaccination campaigns)
b) Routinely through ANC and post-natal care,
c) Through the private sector via vouchers and/or social marketing

Different delivery strategy depending on target population
Entire population - catch up – campaigns
Under fives, pregnant women - through routine services (ANC, immunization well-baby clinics)

Current default setting: 50% community, 50% clinic

Drugs and Supplies required Per Person
1 Insecticide-treated net every 3 years = 1/3 net every year (UNICEF, about $4.45 per net)

Intervention 62: Indoor residual spraying (IRS)

Definition:
IRS is the application of long-acting chemical insecticides on the walls and roofs of all houses and domestic animal shelters in a given area, in order to kill the adult vector mosquitoes that land and rest on these surfaces. The primary effects of IRS towards curtailing malaria transmission are: i) to reduce the life span of vector mosquitoes so that they can no longer transmit malaria parasites from one person to another, and ii) to reduce the density of the vector mosquitoes.

Population in Need:
Populations living in malaria-endemic and epidemic areas
Database for 75 countries in WHO's CHCET Model.

Possible Delivery Channels:
Community level.

Drugs and Supplies required per HH:
DDT has long been the cheapest insecticide and the one with the longest residual efficacy against malaria vectors (6–12 months depending on dosage and substrate). Other insecticides have relatively shorter residual effect (pyrethroids: 4–6 months; organophosphates and carbamates: 2–6 months). Thus, the use of DDT alternatives might require two to four spray cycles per year instead of one, depending on the length of the transmission season, with important operational and financial implications for spraying programmes.

Table 72: Average annual economic cost for ITN and IRS programs. Assumes all nets are conventional ITNs with site-specific prices. Results from base scenarios or sensitivity analysis in the country chapters (according to situation in country)(2005 USD).

ITN program	Average cost per ITN distributed	Average cost per TNY	Cost per death averted (ITN)	Cost per DALY averted (ITN)
Eritrea	4.74	1.43	1,722	52
Malawi	3.36	3.04	1,222	37
Tanzania	4.80	2.17	1,745	53
Senegal	8.05	6.05	2,926	89
Togo*	3.23 2.75	3.23 2.75	1174 998	36 30

IRS program	Cost per person protected (whole population)	Cost per under-five child protected	Cost per death averted	Cost per DALY averted
KwaZulu-Natal	3.27	23.96	4,357	132
LSDI/MOZAL	3.90	21.63	3,933	119

*First value assumes an average net cost of USD 4.33 (the cost incurred effectively and used in chapter 9) while the second value assumes a cost of USD 3, which is more representative for a conventional net.

Source: Joshua Yukich et al. 2008. Operations, Costs and CE of 5 Insecticide-Treated Net Programs.

Intervention 63: Malaria treatment (adults)

Definition:
Diagnosis and treatment with artesunate-based drugs (ACTs). Hospitalization for severe malaria.

Population in Need:
Adults suffering from malaria.
Source: Kiszewski et al. 2007. Estimated global resources needed to attain international malaria control goals. Bulletin of the World Health Organization 2007;85:623–630
Methodology for estimating the costs of global malaria control (2006-15), at http://www.who.int/malaria/costing
CHECK

Delivery Level:
Health Center and Hospital.

Drugs and Supplies required Per Case:
Diagnosis:
Default assumption is that rapid diagnostic tests (RDTs) are used for diagnosis. In some settings, microscopy may be used.

c) RDT, $0.45 (UNICEF)
d) Microscopy, slide + stain, $0.03 (Tom estimate)

It is assumed that more women are tested than end up being diagnosed with malaria, therefore costing for 125% of all malaria cases.

Treatment:
Assuming 100% Artesunate-based treatment. 3 options

1. Artemeter + Lumefantrine
2. Artesunate + Amodiaquine
3. Artesunate + SP

Based on WHO treatment guidelines:
http://apps.who.int/malaria/docs/TreatmentGuidelines2006.pdf

Artemether-lumefantrine
This is currently available as co-formulated tablets containing 20 mg of artemether and 120 mg of lumefantrine. The total recommended treatment is a 6-dose regimen of artemether-lumefantrine twice a day for 3 days.

Table 1. Dosing schedule for artemether-lumefantrine

Body weight in kg (age in years)		No. of tablets at approximate timing of dosing[a]					
		0 h	8 h	24 h	36 h	48 h	60 h
5–14	(< 3)	1	1	1	1	1	1
15–24	(≥ 3–8)	2	2	2	2	2	2
25–34	(≥ 9–14)	3	3	3	3	3	3
> 34	(> 14)	4	4	4	4	4	4

[a] The regimen can be expressed more simply for ease of use at the programme level as follows: the second dose on the first day should be given any time between 8 h and 12 h after the first dose. Dosage on the second and third days is twice a day (morning and evening).

Artesunate + amodiaquine

This is currently available as separate scored tablets containing 50 mg of artesunate and 153 mg base of amodiaquine, respectively. Co-formulated tablets are under development. The total recommended treatment is 4 mg/kg bw of artesunate and 10 mg base/kg bw of amodiaquine given once a day for 3 days.

Table 2. Dosing schedule for artesunate + amodiaquine

Age	Dose in mg (No. of tablets)					
	Artesunate (50 mg)			Amodiaquine (153 mg)		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
5–11 months	25 (½)	25	25	76 (½)	76	76
≥ 1–6 years	50 (1)	50	50	153 (1)	153	153
≥ 7–13 years	100 (2)	100	100	306 (2)	306	306
> 13 years	200 (4)	200	200	612 (4)	612	612

Artesunate + sulfadoxine–pyrimethamine

This is currently available as separate scored tablets containing 50 mg of artesunate, and tablets containing 500 mg of sulfadoxine and 25 mg of pyrimethamine. The total recommended treatment is 4 mg/kg bw of artesunate given once a day for 3 days and a single administration of sulfadoxine-pyrimethamine (25/1.25 mg base/kg bw) on day 1.

Table 3. Dosing schedule for artesunate + sulfadoxine-pyrimethamine

Age	Dose in mg (No. of tablets)					
	Artesunate (50 mg)			Sulfadoxine-pyrimethamine (500/25)		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
5–11 months	25 (½)	25	25	250/12.5 (½)	–	–
≥ 1–6 years	50 (1)	50	50	500/25 (1)	–	–
≥ 7–13 years	100 (2)	100	100	1000/50 (2)	–	–
> 13 years	200 (4)	200	200	1500/75 (3)	–	–

Non-complicated cases:

Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case
Diagnosis						
Malaria test kit (RDT)	150	Assumption that some tested will be negative	1	1	1	1
Slide and stain for microscopy	150		1	1	1	1
Treatment						
Artemether + Lumefantrine, tablets, 20+120mg, 6x1 blister	0	2x a day for 3 days	2	1	3	6
Artesunate + Amodiaquine, tablets, 50mg+153mg, 3+3 blister	100	1 tablet each 1x a day for 3 days	1	1	3	3
Artesunate + SP, tablets, 50mg+500mg+25mg, 3+1	0	3 tablets of Arte, 1 of SP	1	1	1	1

blister						

Personnel Time Required per Case:
Nurse 10-15 minutes

Intervention 64: ITN (pregnant women)

Definition:
Same as intervention 61, only for pregnant women

Population in Need:
All pregnant women living in endemic areas.

Possible Delivery Channels:
The intervention should be delivered during routine ANC which would suggest a delivery mechanism that was the same as Intervention 4 (100% clinic-level).

Drugs and Supplies required Per Woman: See intervention 61.
1 Insecticide-treated net every 3 years = 1/3 net every year (UNICEF, about $4.45 per net)

Intervention 65: IPT (pregnant women)

Definition:
Intermittent presumptive treatment of malaria of all pregnant women living in areas endemic for P. falciparum. Administration of 2 doses of sulfadoxine-pyremethamine 1 month apart during routine ANC visits

Population in Need:
All pregnant women living in endemic areas. Intervention not effective in epidemic areas. Only for first 2 pregnancies (Thom).[5]
Currently the model is using WHO Child Health Costing Tool database – % of children living in malaria endemic areas, source unclear (see Annex for values).

Possible Delivery Channels:
The intervention should be delivered during routine ANC which would suggest a delivery mechanism similar to ANC (current default setup 100% clinic).

Drugs and Supplies required Per Woman:
2 doses of sulfadoxine + pyrimethamine tablets

Personnel Time Required per Case:
Default assumption: Nurse 5 minutes total (2 visits @2.5 minutes each)

Intervention 66: Case management of malaria (pregnant women)

Definition:
Same as Intervention 63, pregnant women only.

Population in Need:
All pregnant women with malaria.

Possible Delivery Channels:
Same as Intervention 63.

[5] *Comments by Richard C. Use Oxford reference for % women*
Check countries with IPT. Global malaria report has population at risk focus on high malaria transmission, multiply by %WIFA (from UN pop prospects). (No IPT in low endemic areas.) Check TMIH paper

Drugs and Supplies required Per Woman:
Same as Intervention 63.

Personnel Time Required per Case:
Same as Intervention 63.

TUBERCULOSIS

Intervention 67: TB Detection and Treatment

Definition:
Detection of TB cases through smears and X-rays

Population in Need:
Population suspected of having TB.
Assumption that 10 suspected cases need to be tested to detect 1 actual case of TB (ss+ and ss-).
For diagnosis this means at least 3 slides per suspect, therefore 30 slides per detected TB case and 9 X-rays. During treatment at least 6 slides per ss+ case.

Possible Delivery Channels:
Through community health workers at community level, through clinics and clinic outreach

Default assumptions used in the model (can and should be changed by the user to reflect local programming and circumstances): 50% clinic, 50% hospital.

Drugs and Supplies required Per Case:
3 slides per suspect for diagnosis (30 slides per detected case) + 0.9 X-rays

Consumables kit	Contains dissolved reagents (min. shelf life 3 years) and all other consumables like microscope slides, filter paper, immersion oil, etc. needed to prepare 1000 slides.	1	$204.00	$204.0000
Equipment starter kit	Contains all materials needed to fully equip a new (or refurbish an existing) laboratory unit to perform smear microscopy. Content: 1. WHO publications - Quantity: 1 of each book Laboratory Services in Tuberculosis Control: - Part 1 Organization and Management and - Part 2 Microscopy 2. Laminated wall chart: Zielh-Neelsen staining procedure - Quantity: 1 3. Beaker - Quantity: 2 4. Filter funnel, large - Quantity: 1 5. Filter funnel, medium - Quantity: 1 6. Filter funnel, small - Quantity: 2	1	$133.00	$133.0000
Microscope kit	Contains one high quality biological microscope, as well as one mirror unit, one lamp stand, one rechargeable battery and a charger.	1	$1,190.00	$1,190.0000

Source: http://www.stoptb.org/gdf/drugsupply/drugs_available.asp

CONSUMABLES KIT
Contains materials sufficient to prepare and stain 1000 sputum smears

	Item	Quantity per kit
1	Strong Carbol Fuchsin	5 x 1 liter
2	Methylene Blue (3g/l)	5 x 1 liter
3	Acid alcohol 3% v/v	7 x 1 liter
4	Industrialized methylated spirit	1 x 2.5 liter
5	Immersion oil	5 x 20 ml
6	'Lysol' 5% solution' (Phenol disinfectant)	5 x 1 liter
7	Slides	20 boxes of 50 slides
8	Filter paper	1 box / 100 circles
9	Lens cleaning tissue	2 pkts / 100 tissues
10	Waterproof Marker Pens	2
11	Gloves	3 boxes / 100 gloves
12	Instruction books	1
13	Material Safety Data Sheet	1 each for: Box 1 of 2 & Box 2 of 2
14	Inventory list	2 copies

Personnel Time Required per Case:

Staff type	Percent treated by	Note	Minutes	Number of days/visits	Total minutes
Nurses	100	Collecting sputum sample	5	1	5
Laboratory technicians/assistants	100	Analysis of smear, culture samples	15	3	45
Radiographers/X-ray technicians	100	X-rays	15	1	15

Number of Visits Required:
1 outpatient visit.

Intervention 68: First-Line Treatment – Category I and III Patients

Definition:
Detection of TB cases through smears and X-rays and case management of category I and III patients

Population in Need:
Ss+ and ss- patients in category I and III

Possible Delivery Channels:
Through community health workers at community level, through clinics and clinic outreach
Default assumptions used in the model (can and should be changed by the user to reflect local programming and circumstances): 50% community level, 25% outreach, 25% clinic

Drugs and Supplies required Per Case:

Drug Prices

Cat I & III Kit A	Stop TB Cat. I+III Patient Kit A 6 blisters (168) 4-FDC tablets (R150/H75/Z400/E275) 12 blisters (336) 2-FDC tablets (R150/H75)	1	$17.18
Cat I & III Kit B	Stop TB Cat. I+III Patient Kit B 6 blisters (168) 4-FDCs (R150/H75/Z400/E275 18 blisters (504) 2-FDC tablets (E400/H150)	1	$30.82
Cat I & III Kit B	Stop TB Cat. I+III Patient Kit B 6 blisters (168) 4-FDCs (R150/H75/Z400/E275 18 blisters (504) 2-FDC tablets (E400/H150)	1	$29.68
Cat I & III Kit C	Stop TB Cat. I+III Patient Kit C 6 blisters (168) 4-FDCs (R150/H75/Z400/E275) 18 blisters (504) 2-FDC tablets (R150/H150)	1	$14.68
Cat II Kit A1	Stop TB Cat. II Patient Kit A1: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 2-stroke auto-disabling syringes & needles, 15 blisters (420) 3-FDC tablets (R150/H75/E275)	1	contact GDF
Cat II Kit A2	Stop TB Cat. II Patient Kit A2: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 syringes & needles, 15 blisters (420) 3-FDC tablets (R150/H75/E275)	1	contact GDF
Cat II Kit B1	Stop TB Cat. II Patient Kit B1: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 2-stroke auto-disabling syringes & needles, 15 blisters (420) 2-FDC tablets (R150/H75), 10 blisters (280) tablets E400	1	contact GDF
Cat II Kit B2	Stop TB Cat. II Patient Kit B2: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 syringes & needles, 15 blisters (420) 2-FDC tablets (R150/H75), 10 blisters (280) tablets E400		

Source: http://www.stoptb.org/gdf/drugsupply/drugs_available.asp

Personnel Time Required per Case:

Staff type	Percent treated by	Note	Minutes	Number of days/visits	Total minutes
Nurses	100	Collecting sputum sample	5	1	5
Laboratory technicians/assistants	100	Analysis of smear, culture samples	15	3	45
Radiographers/X-ray technicians	100	X-rays	15	1	15

Intervention 69: First-Line Treatment – Category II Patients (Re-treatments)

Definition:
Case management of category II patients (re-treatments)

Population in Need:
Ss+ and ss- patients in category II

Possible Delivery Channels:

Through community health workers at community level, through clinics and clinic outreach

Default assumptions used in the model (can and should be changed by the user to reflect local programming and circumstances): 50% community level, 25% outreach, 25% clinic

Drugs and Supplies required Per Case:

Cat II Kit A1	Stop TB Cat. II Patient Kit A1: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 2-stroke auto-disabling syringes & needles, 15 blisters (420) 3-FDC tablets (R150/H75/E275)	1
Cat II Kit A2	Stop TB Cat. II Patient Kit A2: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 syringes & needles, 15 blisters (420) 3-FDC tablets (R150/H75/E275)	1
Cat II Kit B1	Stop TB Cat. II Patient Kit B1: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 2-stroke auto-disabling syringes & needles, 15 blisters (420) 2-FDC tablets (R150/H75), 10 blisters (280) tablets E400	1
Cat II Kit B2	Stop TB Cat. II Patient Kit B2: 9 blisters (252) 4-FDC tablets (R150/H75/Z400/E275), 60 vials of Streptomycin 1gr, 60 vials of water for injection 5ml, 60 syringes & needles, 15 blisters (420) 2-FDC tablets (R150/H75), 10 blisters (280) tablets E400	

Source: http://www.stoptb.org/gdf/drugsupply/drugs_available.asp

Personnel Time Required per Case:
TBD

Number of Visits Required:
TBD

Intervention 70: First-Line Treatment – Children

Definition:
Case management of children under 15 years of age.

Population in Need:
Ss+ and ss- children.

Possible Delivery Channels:
Through community health workers at community level, through clinics and clinic outreach.
Default assumption same as Intervention 67 and 68.

Drugs and Supplies required Per Child:

PC 13 Ped PWBs	Paediatric patient kit (6-10kgs) containing 2 pouches. Schedule 5 pouch - 24 combi-packs containing 1 x 75mg tab of Rifampicin, 1 x 75mg tab of Isoniazid, 1 x 200mg tab of Ethambutol and 1 x 250mg tab of Pyrazinamide. Schedule 6 pouch - 18 multi-blister calendar combi-packs containing 3 x 75mg tabs of Rifampicin, 3 x 75mg tabs of Isoniazid and 4 x 5mg tabs of Pyridoxine	1	$4.08
PC 14 Ped PWBs	Paediatric patient kit (11-17kgs) containing 2 pouches. Schedule 7 pouch - 24 combi-packs containing 1 x 150mg tab of Rifampicin, 1 x 150mg tab of Isoniazid, 1 x 400mg tab of Ethambutol and 1 x 500mg tab of Pyrazinamide. Schedule 8 pouch - 18 multi-blister calendar combi-packs containing 3 x 150mg tabs of Rifampicin, 3 x 150mg tabs of Isoniazid and 4 x 5mg tabs of Pyridoxine	1	$5.58

Source: http://www.stoptb.org/gdf/drugsupply/drugs_available.asp

Personnel Time Required per Child:
TBD

Number of Visits Required:
TBD

Intervention 71: Case Management of Multi-Drug Resistant (MDR) TB Cases

Definition:
Case management of MDR-TB Cases.

Population in Need:
TB cases that develop multiple drug resistance.
Source: WHO TB Budgeting Tool

Possible Delivery Channels:
100% Hospital.

Drugs and Supplies required Per Case:
There are 4 detailed studies of costs and cost-effectiveness of pilot projects of MDR (Peru, Philippines, Estonia and Russia). The costs per patient in the table below are based on these studies. The model user is asked to choose one of the countries where there are available studies, preferably the most similar one, and the model will extrapolate the data to his/her country using comparative GNI per capita data.

Unit cost per MDR-TB patient treated				
	Peru	*Philippines*	*Estonia*	*Russia*
TB Drugs, second-line	$2,575	$2,575	$4,063	$4,063
Hospitalization, MDR-TB	$0	$28	$187	$290
DOT visits	$68	$30	$37	$67
Sputum smears, cultures, DST and X-rays	$14	$54	$13	$24
Training, MDR-TB	$8	$66	$5	$26
MDR-TB programme and data management	$36	$184	$26	$70
Food parcels	$52	$0	$0	$11
Adverse events	$2	$44	$0	$0
Other, MDR-TB	$28	$57	$13	$84
Total cost per MDR-TB patient to treat	$2,783	$3,039	$4,345	$4,636

Source of GNI data: Source: World Development Indicators database, World Bank, 7 October 2009
http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf

Personnel Time Required per Case:
TBD

Number of Visits Required:
TBD

HIV/AIDS

PREVENTION

Intervention 72: Voluntary counseling and testing (VCT)

Definition:

HIV tests + counseling

Population in Need:
All adults wanting to be tested.
The number of people that will ever want to be tested is less than the number of sexually active people. Those who perceive no risk of infection are unlikely to seek testing. Testing is most likely to be sought by those with multiple partners and those who suspect that their partner has other partners. The model estimates the number of people wanting to be tested in any five year period as twice the prevalence of HIV infection. Thus, the population seeking testing each year is the number of sexually active men and women multiplied by twice the prevalence and divided by 5 years.

Coverage:
Of persons that should receive VCT % receiving it.

Cost per person Tested
Goals model: "The cost of a single session of voluntary counseling and testing should be entered as the input variable. Note that this is not the cost of a group session of counseling, but instead is the cost per person per session. Group counseling may take place as part of a PMTCT program, but those costs are calculated separately below. The default value used here of US$27 is from Kenya (Sweat et al., 1998). Costs from other studies are summarized below:

Table 4. Voluntary Counseling and Testing Cost per person

Country	Cost per person	Source
South Africa	US$11.00	Wilkinson et al., 1997
Uganda	US$5.32-13.39	Alwano-Edyegu and Marum, 1999
Kenya	US$16.00-27.00	Mutemi et al., 2000
Uganda	US$12.00	UNAIDS, 1999b
Tanzania	US$28.93	Sweat et al., 1998
Kenya	US$26.65	Sweat et al., 1998
Ghana	US$20.00	Kumaranayake et al., 2001

For ingredients-based costing required - detailed breakdown of costs:
HIV test ($1.40) + 30 minutes of nurse time for counseling and 15 minutes of lab time for the test.

Intervention 73: Condom provision

Definition:
Condom provision for persons with casual partners

Population in Need:
The ***Goals*** model uses four risk categories:

- Men who have Sex with Men (MSM)
- High
- Medium
- Low

Although the definition of these risk groups may vary by country, the following provides suggested definitions:

1. The **MSM** group consists of those men who have sex with other men.
2. Those men and women in the **high risk group** either have many partners per year, such as sex workers (SWs), or have sex with SWs.
3. Men and women in the **medium risk group** are those who have more than one sexual partner per year, but do not engage in commercial sex. For example, someone who is married but has casual sex with one or two other partners throughout the year would be in the medium risk category.
4. Finally, the **low risk category** contains men and women who have only one sexual partner per year.

All but sexually not active men/women are assumed to require condoms.

Coverage:
Current condom use: Estimate of percent of sex acts protected by risk category/gender.

Cost per male/female condom distributed by public sector/social marketing
(GOALS): The cost of a distributed condom should reflect the cost to the government or to the social marketing program. Sometimes this cost will be the commodity cost alone, while other times the cost will include the distribution costs associated with it, including operational and management costs. The default unit cost per male condom distributed for social marketing programs of US$0.20 is based on an analysis of 23 condom social marketing programs between 1990-1996 (Stallworthy, 1998). In this study, the unit cost includes costs such as cost of the condom, operations, management, technical assistance and other indirect costs. Although the cost per condom sold varied between US$0.08-US$0.13 for several large countries with long-running programs, the average unit cost per condom sold for 13 other countries ranged between US$0.17-US$0.34. In addition, there were a few outliers where costs were greater than US$0.40 per condom. Thus here an average of **US$0.20 per condom distributed** is used as a default value. Note that this cost includes the commodity cost of the condom. The default values for public sector condom distribution are estimated to be about half of the social marketing costs. The user may change these values, if desired.

Total number of condoms required *is calculated by multiplying the number of sex acts that need to be protected by the coverage rate. The total number of sex acts is calculated by multiplying the population in the different risk groups by their group-specific coital frequency (number of sex acts per year).*

RNM:
1. Cost per male condom distributed by the public sector. This should generally include the full costs of distribution, not just the cost of the condom itself. For countries with data available the median cost is $0.14 with an inter-quartile range of $0.10 - $0.30.
2. Cost per condom distributed by social marketing. For countries with data available the median cost is $0.14 with an inter-quartile range of $0.10 - $0.30.

This intervention covers the condoms provided to a number of interventions (workplace programs, intervention for sex workers, MSMs, etc.) The number of condoms required for each of these programs (and cost) will be shown disaggregated by intervention.

Intervention 74: Male Circumcision

Male circumcision is one of the oldest and most common surgical procedures known. It is undertaken for cultural, religious, social as well as medical reasons.
The evidence that adult male circumcision is efficacious in reducing sexual transmission of HIV from women to men is compelling. The partial protective effect of male circumcision (approximately 60% reduction in risk of heterosexually acquired HIV infection) is remarkably consistent across the observational studies (ecological, cross-sectional and cohort) and the three randomized controlled trials conducted in diverse settings.

Population in Need:
The target population will depend on a country's priorities. The recently developed *Male Circumcision: Decision Makers' Program Planning Tool*[6] *suggests the following possible target groups:*
- *All adult males*
- *15-29 year old men*
- *Adolescent men prior to their sexual debut*
- *Newborn males*
- *Most-at-risk males*

Coverage:
% of selected target population circumcised

Delivery Channel:
Default setting: 50% health center, 50% hospital

[6] *Bollinger, L., W. DeCormier Plosky, and J. Stover. 2009. Male Circumcision: Decision Makers' Program Planning Tool, Calculating the Costs and Impacts of a Male Circumcision Program. Washington, DC: Futures Group, Health Policy Initiative, Task Order 1.*
http://software.futuresgroup.com/MaleCircumcision/MC_manual.pdf

Drugs and Supplies Required per Case:
The UHM will use the drugs and supply types and quantities as listed in the MC tool (about **$12** in drugs and supply costs per average case).

Direct Costs- Drugs & Supplies Return to Menu

Essential cells that should be completed
Default data cells that can be changed if information is available

Intervention	Description of treatment line	Percent of intervened receiving this line at Facility	Number	Times per day	Days per case/ episode	Treatment units per case/ episode	Unit cost	Cost per case or episode	Average cost per patient at Facility
CONSUMABLES									
Pre-circumcision									
Pre-circumcision	Rapid test	100%	1	1	1	1	$2.46	$2.46	$2.46
Pre-circumcision	Gloves, examination, non-sterile, disposable, pair	100%	1	1	1	1	$0.05	$0.05	$0.05
Circumcision									
Circumcision	Gloves, surgeons, sterile disposable, pair	100%	4	1	1	4	$0.21	$0.83	$0.83
Circumcision	Gloves, examination, non-sterile, disposable, pair	100%	2	1	1	2	$0.05	$0.10	$0.10
Circumcision	Surgical Mask	100%	3	1	1	3	$0.04	$0.11	$0.11
Circumcision	Surgical cap (disposable)	100%	3	1	1	3	$0.33	$0.98	$0.98
Circumcision	Goggles (for surgery)	0%	0	1	1	0	$0.00	$0.00	$0.00
Circumcision	Surgical scrub Betadine	100%	30	1	1	30	$0.02	$0.55	$0.55
Circumcision	Hibiscrub	0%	0	1	1	0	$0.00	$0.00	$0.00
Circumcision	Salvalon	0%	0	1	1	0	$0.01	$0.00	$0.00
Circumcision	Povidone antiseptic solution	100%	40	1	1	40	$0.00	$0.15	$0.15
Circumcision	Gauze pad, sterile, 8ply 100x100mm	100%	12	1	1	12	$0.01	$0.08	$0.08
Circumcision	Gauze pad, sterile, 12ply 76x76mm	0%	0	1	1	0	$0.01	$0.00	$0.00
Circumcision	Lignocaine 2%, injection 20ml	100%	20	1	1	20	$0.12	$2.36	$2.36
Circumcision	Needle 21 guage	100%	1	1	1	1	$0.03	$0.03	$0.03
Circumcision	Needle 18 guage	100%	1	1	1	1	$0.03	$0.03	$0.03
Circumcision	Syringe, 10ml, disposable	100%	1	1	1	1	$0.03	$0.03	$0.03
Circumcision	Ketamine, injection 50mg/ml	0%	0	1	1	0	$0.12	$0.00	$0.00
Circumcision	Thiopental, injection 1g + diluent	0%	0	1	1	0	$0.00	$0.00	$0.00
Circumcision	IV canula (Jelo radiopaque) 18 guage	0%	0	1	1	0	$1.67	$0.00	$0.00
Circumcision	Glucose 5% in water + set, 500ml	0%	0	1	1	0	$0.96	$0.00	$0.00
Circumcision	Blade, 22, 23 or 24	100%	1	1	1	1	$0.02	$0.02	$0.02
Circumcision	Suture, catgut chromic 3/0, 150cm	0%	0	1	1	0	$7.24	$0.00	$0.00
Circumcision	Suture, catgut chromic 4/0, 150cm	100%	1	1	1	1	$0.68	$0.68	$0.68
Circumcision	Suture, silk, 2 x 0.75m	0%	0	1	1	0	$5.11	$0.00	$0.00
Circumcision	Gauze pad, Jelonet (paraffine vaseline)	0%	0	1	1	0	$0.17	$0.00	$0.00
Circumcision	Gauze pad, Inadine	100%	1	1	1	1	$0.17	$0.17	$0.17
Circumcision	Elastoplast/Dermaplast 25mm/9m	50%	10	1	1	5	$0.17	$0.85	$0.43
Circumcision	Micropore	50%	10	1	1	5	$0.17	$0.85	$0.43
Circumcision	Tegaderm (3M) 1624	0%	0	1	1	0	$4.38	$0.00	$0.00
Circumcision	Bandage (elastic)	5%	1	1	1	0.05	$0.06	$0.00	$0.00
Circumcision	Iboprufen, Brufen 400mg	0%	1	3	5	0	$0.00	$0.00	$0.00
Circumcision	Paracetamol, tablets 500mg	100%	1	3	7	21	$0.04	$0.82	$0.82
Circumcision	Amoxycillin, 500mg	0%	0	3	7	0	$0.01	$0.00	$0.00
Circumcision	Cloxacillin, 500mg	0%	0	4	7	0	$0.04	$0.00	$0.00
Neonatal Circumcision									
Neonatal Circumcision	Gloves, surgeons, sterile disposable, pair	100%	4	1	1	4	$0.21	$0.83	$0.83
Neonatal Circumcision	Gloves, examination, non-sterile, disposable, pair	100%	2	1	1	2	$0.05	$0.10	$0.10
Neonatal Circumcision	Surgical Mask	100%	3	1	1	3	$0.04	$0.11	$0.11

Source: *Male Circumcision: Decision Makers' Program Planning tool.*

Human Resources Required per Case:
The following shows personnel requirements in minutes.

PERSONNEL TIME REQUIREMENTS PER INDIVIDUAL INTERVENTION (IN MINUTES)

Personnel Type	Pre-circumcision	Circumcision	Neonatal Circumcision	Post-Circumcision - Normal	Complication - Hemorrhage	Complication - Sepsis	Complication - Other 1	Complication - Other 2	Circumcision Follow-up	Number of hours needed per normal circumcision	Number of hours needed per normal neonatal circumcision
FACILITY											
OPD Nurse										--	--
Counselor	20.00									0.33	--
Surgical Nurse	8.00	25.00	25.00		10.00	20.00				0.55	0.42
Nurse anaesthetist		20.00	20.00		10.00					0.33	0.33
Nurse assistant		25.00	25.00	8.00					8.00	0.68	0.55
Auxiliary//Attendant					5.00					--	--
Anaesthetist										--	--
Physician	5.00	25.00	25.00	8.00	10.00					0.63	0.55
Lab technician	10.00									0.17	--
Other 1										--	--

Source: *Male Circumcision: Decision Makers' Program Planning tool.*

Intervention 75: PMTCT

Definition:
1) HIV testing and counselling for all pregnant women

2) ART for mother and newborn
For pregnant women with HIV who do not yet require ART, the recommended regimens by WHO are based around AZT (zivovudine) (from 28 weeks of pregnancy or as soon as possible thereafter) plus single-dose nevirapine, and one-week AZT for the infant.

3) Infant feeding counseling
Mothers who are known to be HIV negative and mothers with unknown HIV status are assumed to receive routine breastfeeding counselling as described under intervention 121. Mothers with HIV positive status receive 2 *additional* infant feeding counselling sessions at a regular Antenatal Care visit, and two additional infant feeding counselling sessions at a regular Post Natal Care visit, plus one *additional* visit at 6 weeks after births, when the results of a PCR test for the child are assumed to be available.
Water is assumed to be safe for those mothers living on an income of more than $ 1 a day and replacement feeding is considered to be AFASS.

Population in Need:
HIV testing for all women, ART and breastfeeding counselling for women who are HIV+, ART for all newborns delivered to HIV+ mothers.

Possible Delivery Channels:
Default setup: 50% clinic, 50% hospital

Drugs and Supplies required Per Woman/Newborn:
1) HIV test
2) ART
   - AZT (zidovudine) (from 28 weeks of pregnancy or as soon as possible thereafter to delivery)
   - Single-dose nevirapine for the mother at delivery, and one-week AZT for the infant.

3) Replacement Feeding
Cost of providing replacement feeding (commercial infant formula) for twelve months to HIV-positive mothers (alternative is 6 months of formula and 6 months of whole milk)

Personnel Time Required per Woman/Newborn:
1) HIV testing and counselling
   Costs include one group counselling session on testing for HIV, and for women consenting to take an HIV test and for which the test is confirmatory, further (individual) counselling sessions
2) ART: Nurse/midwife total of 60 minutes
3) Infant feeding counseling sessions : Nurse/midwife 5 x 15 minutes

INTERVENTIONS 76-87 WILL BE COSTED IN THE PROGRAM COSTING SECTION OF tHE ONEHEALTH MODEL

Intervention 76: Mass media

Definition:
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Population in Need:
Population aged 15-64

Coverage:
% of total population reached by campaigns.

Cost per Campaign/Person Reached:
There are two different ways of calculating the cost of a mass media intervention – using activity-based costing, multiplying the number of campaigns planned by the cost per campaign and or calculating cost by multiplying the number of people to be reached by the cost of reaching one person. GOALS uses the latter.

For **cost per person reached** GOALS makes a number of assumptions regarding the average campaign cost and the number of persons reached by each campaign.
The model suggests using a default value of **US$1** per person reached with mass media annually. This figure is based on three assumptions:

- an average campaign price of US$500,000
- six campaigns per year, based on coverage rates in Schwartlander et al. (2001) which assumed 2 campaigns per year when HIV prevalence is less than 0.5 percent, 4 campaigns per year when HIV prevalence is between 0.5 and 1.0 percent, 5 campaigns per year when HIV prevalence is between 1.0 and 5.0 percent, and 6 campaigns per year when HIV prevalence is greater than 5.0 percent
- an adult population of approximately 6 million people, half of which is assumed to be reached by the mass media campaign.

The RNM calculates costs not per person reached but as a total amount spent on campaigns, using the median cost per media campaign of $150,000 (range of $70,000 to $390,000) and multiplying this cost with the annual number of campaigns planned.

Other Info:

Table 6. Cost for mass media interventions

Country	Cost per campaign	Cost per capita	Source
Dominican Republic	US$438,677	US$0.06	Cited in Soderlund et al., 1993
Cameroon	US$516,817		Kumaranayake et al., 1998, cited in Bonnel, 2001
Ghana	US$154,500		Kumaranayake et al., 2000
Zimbabwe	US$58,205*		Kumaranayake et al., 2000
Gabon	US$357,347	US$0.32	Dubow, 1992, cited in Soderlund et al., 1993
* Marginal costs of intervention only			

Source: GOALS manual

Intervention 77: Community mobilization

Definition:
---.

Population in Need:
Population aged 15-64

Coverage:
% of total population reached by this intervention·

The GOALS model actually advises the user to calculate this as funding available divided by the unit costs divided by the total need. For this intervention this would be:

Coverage = funding for community mobilization / cost per community worker trained x number of people reached per community worker /population 15-49

To illustrate this formula: Assuming a country has $200,000 to spend on community mobilization, and it costs $1000 to train a CW who then can reach 500 people (i.e., $2 per person reached). If the country has a population of 1 million it would cost $2 million (1million x $2) to reach them all. If one divides the available $200,000 by the $2 million one would get an effective coverage rate of 10%.

Since this approach would require already knowing how much it would cost to reach the entire population, for the UHM application the instruction should be to just estimate what percentage of the population is currently reached.

Cost per person reached:

These costs should include all costs associated with training and supporting an outreach worker, including pre-service and in-service training costs, as well as on-going labor costs to implement the intervention. To date, there are no studies that evaluate the costs of providing community outreach workers. The default value of **US$118** is based on information from various national strategic plans".

Based on the 2009 version of the RNM the default cost per person reached is assumed to be **$4.00**

Intervention 78: Youth-focused interventions – In-school

Definition:

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Population in Need:

Number of youth: The number of males and females defined as "youth" in the national population for the years of the strategic plan. The age group can vary, depending on the target population for school-based interventions.

Proportion of youth in school: The percentage of youths of the defined age group enrolled in school. A good source for this information is the World Bank's World Development Report, or the accompanying database, World Development Indicators.

Proportion of youth not in school (for intervention 6): Calculated as the residual of the above, population group to be reached by out-of-school programs.

Coverage:

- % secondary students with teachers trained in AIDS

Cost per youth reached:

Cost per teacher trained divided by average number of youth reached per teacher.

Cost per teacher trained: This input is combined with the number of teachers trained per student to calculate the annual cost of school-based interventions. The cost should include the operating costs of the program, including training, curriculum materials, and labor costs associated with the actual intervention of the teacher reaching the students. The only study with actual data regarding this type of intervention is Boerma and Bennett (1997) for Tanzania. Costs are estimated for both primary and secondary schools, and for two types of programs – low level and medium-level of effort. The low-level cost is based on a simple program, with teacher training and basic materials only, while the medium-level cost scenario includes developing training materials and establishing the program. The costs are listed in the table below. The default value of US$200 used in this model is the medium-level cost scenario for primary schools. The medium-level costs will capture the ongoing costs of the programs, including the training costs. Note that, most likely, training will not be necessary every year, so that the US$200 figure will also cover the operating costs of the intervention. If the target age group is not the primary school level, then the cost should be adjusted appropriately.

Table 5. Cost per teacher trained

Schooling Level	Low-cost scenario	Medium-cost scenario
Primary	US$75	US$200
Secondary	US$121	US$241

RNM Model: Cost per teacher trained in secondary education. This is the cost to train a secondary school teacher in AIDS education. The median unit cost across countries with information is $75 with an inter-quartile range of $32 - $150.

Students reached per trained teacher: The cost of school-based programs is calculated based on the number of teachers trained, rather than the number of youths reached, as is the case for programs for out-of-school youths. The estimate should include consideration of pupil-teacher ratios, as well as the number of times a teacher would speak with students per year with this program. The default value supplied is **100**, based on figures used in Schwartlander et al. (2001).

Intervention 79: Youth-focused interventions – Out-of-school

Definition:
Peer education programs.

Population in Need:
School age children not in school.

Number of youth: The number of males and females defined as "youth" in the national population for the years of the strategic plan. The age group can vary, depending on the target population for school-based interventions.

Proportion of youth in school (intervention 5): The percentage of youths of the defined age group enrolled in school. A good source for this information is the World Bank's World Development Report, or the accompanying database, World Development Indicators.

Proportion of youth not in school: Calculated as the residual of the above, population group to be reached by out-of-school programs.

Coverage:
% out-of-school youth reached

Cost per youth reached:
There are no published studies that provide data on the cost of peer education per youth reached. Therefore, following the methodology described in Bonnel (2001), the default cost per youth reached by a peer educator is assumed to fall somewhere between the cost of a workplace program, and the cost of reaching a sex worker, at **US$10.81**."

Intervention 80: Workplace Programs

Definition:
Prevention interventions provided to employees in the work place.

Population in Need:
Employees in the formal sector (all those employees in industry and services plus those in commercial agricultural employment).

Participation rate in formal workforce: The estimate of the number of workers who will be reached in formal sector workplace programs is based on the labor force participation rate in the formal sector. The formal sector is defined as employment in which workers are paid a stable income or wage, or have a contract, or have fringe benefits. This rate is the sum of the percentages of the labor force in the industry and service sectors, available from the World Bank's *World Development Report*, or the accompanying database, *World Development Indicators*. In countries where there is substantial employment in commercial agriculture, within which workplace programs might be undertaken, the percentage of the labor force in formal agriculture should be added to the total. One source for this information is the *United Nations Statistical Yearbook.*

Coverage:
Workforce covered by workplace programs

Cost per employee reached in workplace programs:
Goals model:
The unit cost per employee reached in workplace programs, including costs of the education program, costs of STI treatments if provided and condoms distributed through the intervention. The default value of US$7.14 per employee is based on two factors - an average of four different interventions, described in the table below, and an additional factor for STI treatment costs. The average cost of these four programs is US$6.13, but these programs did not provide STI treatments. An additional US$1.01 cost per employee is added to the default unit cost figure, based on assuming that 10 percent of the workforce is treated at the workplace, and on using the default value of US$10.15 cost per STI case treated.

Table 7. Cost per employee reached

Country	Cost per employee	Source
Zimbabwe	US$10.00	Katzenstein et al., 1998
Zimbabwe	US$6.00	Hyde et al., cited in UNAIDS, 2000b
Tanzania	US$4.00	Hamelmann et al., 1995
Brazil	US$4.50	Hearst et al., 1997

Resource Needs Model provided the option of different coverages for each of the 3 components (peer education, STI treatment and condom distribution) and suggests the following costs.
1. Cost per employee reached with peer education. For countries with data available the median cost is $5 with an inter-quartile rate of $3 - $10.
2. Cost per STI case treated. For countries with data available the median cost is $11 with an inter-quartile range of $9 - $15.
3. Cost per condom distributed. For countries with data available the median cost is $0.15 with an inter-quartile range of $0.12 - $0.27.

Intervention 81: Interventions focused on Commercial Sex Workers

Definition:
Peer counseling for commercial sex workers

Population in Need:
All commercial sex workers.

Coverage:
% sex workers reached by intervention. The percentage of female sex workers that are reached by the intervention.

Cost per CSW reached:
Goals model:
This value consists of the program costs associated with a peer education program for sex workers. These costs should include consideration of training the peer educators, as well as the time spent in the field and any costs associated with distributing condoms. The default value provided in the model is based on a peer education intervention in Cameroon (Kumaranayake et al., 1998). The costs in this intervention ranged from US$15.83-21.12, but did not include the costs of condoms or labor costs of educators. Thus the default value of **US$20** is somewhat higher than the average of the two scenarios, in order to take these costs into account.

Costs for condoms used in this program are not included here but are included in the total cost of intervention 4.

RNM:
Cost per sex worker targeted. The annual cost per female sex worker of peer outreach programs. Unit cost estimates from the country workshops range from $3 - $120, with a median of $25, and inner quartile range of $15 - $60.

Intervention 82: Interventions Targeting Men Having Sex with Men (MSM)

Definition:
Interventions targeting men having sex with men

Population in Need:

Men having sex with men

Coverage:
Percent of sex acts protected.

Cost per person reached (MSM):
The unit cost of reaching someone in the MSM risk group. The default value of US$20 matches the unit cost to reach sex workers, on the assumption that the costs would be similar.

Intervention 83: Interventions Targeting Intravenous Drug Users (IDUs)

Definition:
Interventions targeting intravenous drug users
GOALS suggests the following 3 activities be included in this intervention:

1. IDU – outreach
2. IDU – needle sharing
3. IDU – drug substitution.

RNM suggest s the following activities ;

General harm reduction programs for IDUs. This would be used if there is no information on the specific type of interventions listed below.

a) Counseling and testing for IDUs.
b) Community outreach and peer education for IDUs.
c) Syringe and needle exchange.
d) Drug substitution
e) Condom promotion interventions

Population in Need:
Intravenous drug users

Coverage:
% of IDUS reached by the above activities.

Cost per IUD user reached:
GOASL requires the user to enter cost estimates for the following 3 activities but does not provide any suggested cost in its manual.

4. IDU – outreach
5. IDU – needle sharing
6. IDU – drug substitution.

RNM suggest s the following activities be included in this intervention and suggests that unit costs for the outreach interventions may vary from $10 - $60.

1. Cost of harm reduction programs per IDU reached
2. Cost of counseling and testing per IDU reached
3. Cost of community outreach and peer education per IDU reached
4. Cost per needle distributed and destroyed
5. Cost of drug substitution per IDU reached
6. Cost per condom. This should be the cost to the outreach program. If the condoms are provided free of charge from another source, then the cost should be zero.
7. Cost to train one counselor

Intervention 84: Post-Exposure Prophylaxis

Definition:
Post-exposure prophylaxis (PEP) refers to anti-retroviral treatment provided, usually for one month, to a person who may have been newly exposed to HIV. This is typically provided for health care personnel who may have come in contact with infected blood through a needle stick or other accident and for rape victims.

Population in Need:
Estimated number of PEP kits per million population. Default assumption 1 kit per 1 million population.

Coverage:
Percent of required kits provided.

Cost per case:
$184 per kit (range $124 to $243)
Source: RNM

UNICEF
9901000 PEP kit $587.81 designed for 50 treatment

Kit contents/Description:
10 x 1531001 - Azithromycin 500mg tablets/PAC-10
2 x 1531002 - Cefixime 200mg tablets/PAC-56
50 x 1514130 - Levonorgestrel 75mcg tabs/PAC-2
50 x 1400523 - ZDV + 3TC 300+150mg tabs/PAC-60
50 x 0584500 - Pregnancy test
1 x 1993350 - Note on patents for PEP kits

HIV/AIDS CARE AND TREATMENT

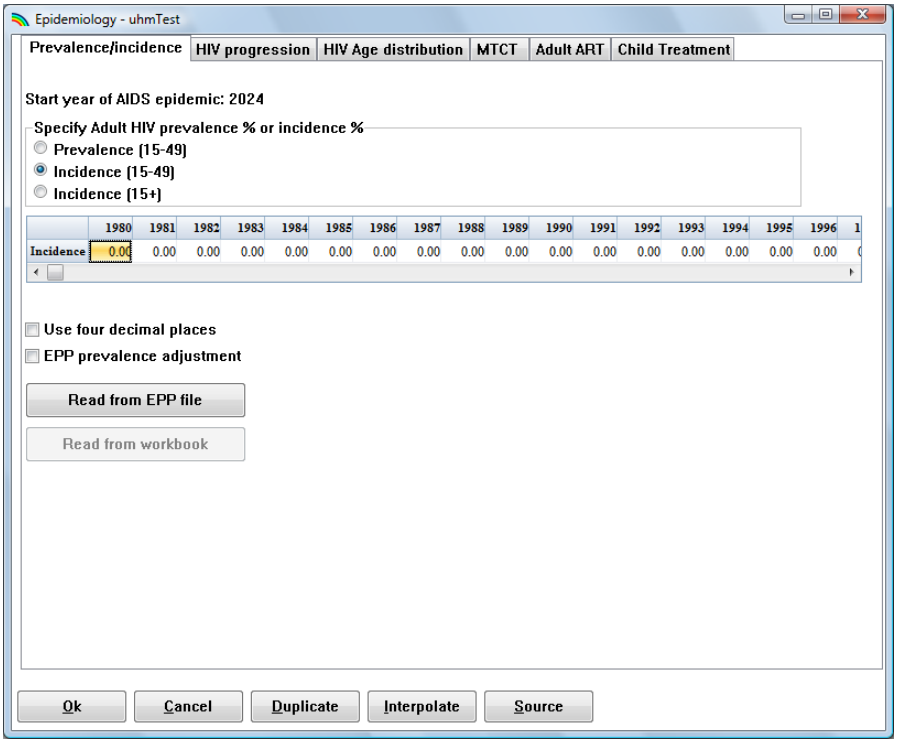
For treatment interventions, the UHM follows the AIM module.

- Anti-retroviral therapy (first line treatment)
- Anti-retroviral therapy (second line treatment)
- Diagnostic tests
- Treatment of opportunistic infections
- Nutrition supplementation
- Cotrimoxazole (children)
- Anti-retroviral therapy (children)

Intervention 85: ART (First-line treatment)

Definition:
Antiretroviral therapy (first line)

Population in Need:
Fed in from AIM module: Total number of people needing ARV therapy (defined by treatment guidelines and eligibility criteria of CD4 count) which includes those newly needing therapy and those who continue successfully on therapy from the previous year. Calculated based on prevalence/incidence and progression and proportion of people surviving each year on ART.



Coverage:
Percent of HIV+ adults eligible for ARVs receiving first-line antiretroviral therapy (ART).

Possible Delivery Channels:
Default setting: 50% health center, 50% hospital

Drugs and Supplies required Per Person per Year:
The model has a mix of regimens based on reporting for the 2010 UNGASS report.

First-line regimen	
Standard strategy	AZT or d4T + 3TC [b] + NVP or EFV
	TDF + 3TC [b] + NVP or EFV
	ABC + 3TC [b] + NVP or EFV
Alternative strategy	AZT or d4T + 3TC [b] + TDF or ABC

ANNEX 3. DOSAGES OF ANTIRETROVIRAL DRUGS FOR ADULTS AND ADOLESCENTS

Generic Name	Dose
NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS	
Abacavir (ABC)	300 mg twice daily or 600 mg once daily
Zidovudine (AZT)	250–300 mg twice daily
Emtricitabine (FTC)	200 mg once daily
Didanosine (ddI) Buffered tablets or enteric-coated (EC) capsules [a]	>60 kg: 400 mg once daily <60 kg: 250 mg once daily
Lamivudine (3TC)	150 mg twice daily or 300 mg once daily
Stavudine (d4T) [b]	>60 kg: 40 mg twice daily <60 kg: 30 mg twice daily
NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS	
Tenofovir	300 mg once daily
NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS	
Efavirenz (EFV)	600 mg once daily
Nevirapine (NVP)	200 mg once daily for 14 days, followed by 200 mg twice daily
PROTEASES INHIBITORS	
Atazanavir + ritonavir (ATV/r)	300 mg +100 mg once daily
Fos-amprenavir + ritonavir (FPV/r)	700mg + 100 mg twice daily
Indinavir + ritonavir (IDV/r) [c]	800 mg + 100 mg twice daily

Source: WHO. Antiretroviral therapy for HIV infection in adults and adolescents : recommendations for a public health approach. – 2006 rev.

Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case
AZT + 3TC + EFV						
Efavirenz (EFV), tablet, 600 mg	11.5%	600 mg once daily	1	1	365	365
Lamivudine (3TC), tablet, 150 mg	11.5%	150 mg twice daily or 300 mg once daily	1	2	365	730
Zidovudine (AZT), capsule, 300 mg	11.5%	250?300 mg twice daily	1	2	365	730
d4T + 3TC + EFV						
Efavirenz (EFV), tablet, 600 mg	14.1%	600 mg once daily	1	1	365	365

Lamivudine (3TC), tablet, 150 mg	14.1%	150 mg twice daily or 300 mg once daily	1	2	365	730
Stavudine (d4T), capsule, 40 mg	14.1%	>60 kg: 40 mg twice daily; <60 kg: 30 mg twice daily	1	2	365	730
TDF + 3TC + EFV						
Tenofovir (TDF), tablet, 300 mg	10.7%	300 mg once daily	1	1	365	365
Efavirenz (EFV), tablet, 600 mg	10.7%	600 mg once daily	1	1	365	365
Lamivudine (3TC), tablet, 150 mg	10.7%	150 mg twice daily or 300 mg once daily	1	2	365	730
AZT + 3TC + NVP						
Lamivudine (3TC), tablet, 150 mg	27.0%	150 mg twice daily or 300 mg once daily	1	2	365	730
Nevirapine (NVP), tablet, 200 mg	27.0%	200 mg once daily for 14 days, followed by 200 mg twice daily	1	2	365	730
Zidovudine (AZT), capsule, 300 mg	27.0%	250?300 mg twice daily	1	2	365	730
d4T + 3TC + NVP						
Lamivudine (3TC), tablet, 150 mg	27.9%	150 mg twice daily or 300 mg once daily	1	2	365	730
Nevirapine (NVP), tablet, 200 mg	27.9%	200 mg once daily for 14 days, followed by 200 mg twice daily	1	2	365	730
Stavudine (d4T), capsule, 40 mg	27.9%	>60 kg: 40 mg twice daily; <60 kg: 30 mg twice daily	1	2	365	730
TDF + 3TC + NVP						
Tenofovir (TDF), tablet, 300 mg	2.7%	300 mg once daily	1	1	365	365
Lamivudine (3TC), tablet, 150 mg	2.7%	150 mg twice daily or 300 mg once daily	1	2	365	730
Nevirapine (NVP), tablet, 200 mg	2.7%	200 mg once daily for 14 days, followed by 200 mg twice daily	1	2	365	730
TDF+FTC+EFV						
Tenofovir (TDF)/ Emtricitabine (FTC), tablet, 300/200 mg	3.5%	300/200 mg once daily	1	1	365	365
Efavirenz (EFV), tablet, 600 mg	3.5%	600 mg once daily	1	1	365	365
TDF+FTC+NVP						
Tenofovir (TDF)/ Emtricitabine (FTC), tablet, 300/200 mg	2.5%	300/200 mg once daily	1	1	365	365
Nevirapine (NVP), tablet, 200 mg	2.5%	200 mg once daily for 14 days, followed by 200 mg twice daily	1	2	365	730

Source: UNAIDS. WHO, UNICEF. Epidemic update and health sector progress towards Universal Access – Progress Report 2011

Annual number of visits to the health system:

9.5 outpatient visits per year, and an average of 1.56 days of hospitalization, based on Stover J, Korenromp EL, Blakley M, Komatsu R, Viisainen K, et al. (Long-Term Costs and Health Impact of Continued Global Fund Support for Antiretroviral Therapy. PLoS ONE 6(6): e21048. doi:10.1371/journal.pone.0021048

Annual days of hospitalization:

1.56 (see above)

Intervention 86: ART (second-line treatment)

Definition:
Antiretroviral therapy (second line) necessitated by treatment failure of first-line regimen

Population in Need: The population in need is defined as HIV+ adults eligible for ART, who have transitioned to second line treatment.

Coverage:
Coverage is entered in AIM under service statistics, and the percentage of people on first line who transition to second line in a given year.

Possible Delivery Channels:
Default setting: 50% health center, 50% hospital

Drugs and Supplies required Per Person per Year:

Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case
TDF+3TC+LPV/r						
Tenofovir (TDF), tablet, 300 mg	29.7%	300 mg once daily	1	1	365	365
Lamivudine (3TC), tablet, 150 mg	29.7%	150 mg twice daily or 300 mg once daily	1	2	365	730
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	29.7%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
AZT+ddI+LPV/r						
Zidovudine (AZT), capsule, 300 mg	27.4%	250-300 mg twice daily	1	2	365	730
Didanosine(ddI), capsule, 400 or 250 mg	27.4%	400 mg once daily (>60 kg) 250 mg once daily (≤60 kg)	1	1	365	365
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	27.4%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
AZT+3TC+LPV/r						
Zidovudine (AZT), capsule, 300 mg	13.9%	250-300 mg twice daily	1	2	365	730
Lamivudine (3TC), tablet, 150 mg	13.9%	150 mg twice daily or 300 mg once daily	1	2	365	730
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	13.9%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
TDF+FTC+LPV/r						
Tenofovir (TDF)/ Emtricitabine (FTC), tablet, 300/200 mg	11.7%	300/200 mg once daily	1	1	365	365
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	11.7%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
AZT+3TC+TDF+LPV/r						
Zidovudine (AZT), capsule, 300 mg	6.0%	250-300 mg twice daily	1	2	365	730
Lamivudine (3TC), tablet, 150 mg	6.0%	150 mg twice daily or 300 mg once daily	1	2	365	730
Tenofovir (TDF), tablet, 300 mg	6.0%	300 mg once daily	1	1	365	365
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	6.0%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
ABC+ddI+LPV/r						
Abacavir (ABC), tablet, 300 mg	5.3%	300 mg twice daily or 600 mg once daily	1	2	365	730
Didanosine(ddI), capsule, 400 or 250 mg	5.3%	400 mg once daily (>60 kg) 250 mg once daily (≤60 kg)	1	1	365	365

Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	5.3%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
ABC+TDF+LPV/r						
Abacavir (ABC), tablet, 300 mg	2.7%	300 mg twice daily or 600 mg once daily	1	2	365	730
Tenofovir (TDF), tablet, 300 mg	2.7%	300 mg once daily	1	1	365	365
Lopinavir/ritonavir (200/50 mg)	2.7%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
D4T+3TC+LPV/r						
Stavudine (d4T), capsule, 40 mg	2.1%	>60 kg: 40 mg twice daily; <60 kg: 30 mg twice daily	1	2	365	730
Lamivudine (3TC), tablet, 150 mg	2.1%	150 mg twice daily or 300 mg once daily	1	2	365	730
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	2.1%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730
ABC+3TC+LPV/r						
Abacavir (ABC), tablet, 300 mg	1.2%	300 mg twice daily or 600 mg once daily	1	2	365	730
Lamivudine (3TC), tablet, 150 mg	1.2%	150 mg twice daily or 300 mg once daily	1	2	365	730
Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	1.2%	800mg/200 mg once daily or 400 mg/100 mg twice daily	2	2	365	730

Based on breakdown of second line regimens inUNAIDS. WHO, UNICEF. *Epidemic update and health sector progress towards Universal Access – Progress Report 2011*

Annual number of visits to the health system:
9.5 outpatient visits per year, and an average of 1.56 days of hospitalization, based on Stover J, Korenromp EL, Blakley M, Komatsu R, Viisainen K, et al. (Long-Term Costs and Health Impact of Continued Global Fund Support for Antiretroviral Therapy. PLoS ONE 6(6): e21048. doi:10.1371/journal.pone.0021048

Annual days of hospitalization:
1.56 (see above)

Intervention 87: Additional ART for TB Patients

Definition:
To avoid interaction with TB drugs , TB patients require different, more expensive ARV regimens. Typically, this is accounted for by the mix of regimens that first and second line patients are receiving. However, if they are calculated separately in a country, this intervention can be used to capture the costs of the more expensive regimens.

Population in Need:
Calculated as number of latent TB infections (adult pop x % with latent TB) times the incidence of active TB among latent cases, with the incidence being a weighted average of incidence with HIV and without.

Coverage:
The AIM model assumes coverage to be the same as ART first-line coverage.

Possible Delivery Channels:
Default setting: 505 health center, 50% hospital

Tests and Supplies required Per Person per Year:

5 recommended treatment regiments

1. **AZT + 3TC + EFV**
2. **d4T + 3TC + EFV**
3. **TDF+3TC+ETF**
4. **AZT + 3TC + ABC**
5. **AZT + 3TC + TDF**

Based on:

12.2. What to start: recommended ART for patients with active TB

The recommended standard first-line ART regimen comprises two NRTIs plus one NNRTI. There are few drug interactions with TB drugs and the NRTI backbone and no specific changes are recommended. The situation is more complex with the NNRTI class because NNRTI levels are reduced in the presence of rifampicin. However, accumulating data support the use of first-line NNRTI-containing antiretroviral regimens in patients receiving rifampicin-containing treatment for TB. Here EFV is the preferred option, because the interactions with rifampicin are easier to manage; but the use of EFV may be limited by its restrictions in pregnant women or women of childbearing potential. NVP is an alternative agent, but carries the risk of hepatotoxicity, particularly in persons with higher CD4 counts or for whom no CD4 count is available.[125] The use of a triple NRTI regimen is emerging as an additional option[126] for first-line ART in TB patients with HIV-2 infection. An initial PI-based regimen can also be considered in HIV-2 infection, with the caveat that it will compromise second-line treatment options.

Two NRTIs + efavirenz

EFV blood levels are decreased in the presence of rifampicin. This can be overcome by a dose increase of 600 mg to 800 mg daily. Emerging evidence does not show any benefit in increasing the EFV dose to 800 mg/daily in patients weighing under 60 kg and receiving both EFV and rifampicin.[127 128 129 130 131] While awaiting more data on EFV dosing for persons weighing 60 kg and above, WHO recommends the standard 600-mg dose of EFV **[A-II]**. Because of concerns related to teratogenicity, EFV should not be used in women of childbearing potential without adequate contraception or in women who are in the first trimester of pregnancy **[A-III]**.

Two NRTIs + nevirapine

NVP levels are also decreased in the presence of rifampicin. However, given the high therapeutic index of NVP and the recent studies in South Africa and Thailand showing good short-term outcomes in antiviral activity and few adverse events in patients receiving both drugs, standard NVP dosing is recommended **[B-II]**.[132 133 134 135 136] This area requires further investigation as there is large interpatient variability in NVP levels among HIV-infected persons, independently of any rifampicin interaction. Because of concerns about safety, close clinical and laboratory monitoring of liver enzymes at weeks 4, 8 and 12 is advised for all patients receiving NVP plus rifampicin.

There are concerns about the risk of symptomatic or fatal hepatitis in women with CD4 counts between 250 and 350 cells/mm^3. The additional influence on the liver toxicity of rifampicin-containing regimens in this population is not known. Until further data are available, nevirapine-containing regimens should only be considered in life-threatening situations and when no alternative is available for women on rifampicin-containing regimens who have CD4 cell counts in the range 250 to 350 cells/mm^3 and need to start ART.

Triple NRTI regimens

Triple NRTIs are considered an alternative regimen in patients undergoing TB treatment. Two triple NRTI regimens (AZT + 3TC + ABC and AZT + 3TC + TDF) can be used safely with rifampicin. Furthermore, either regimen can be used in patients with higher CD4 cell counts where the risk of toxicity for nevirapine may be increased, and in special conditions (HBV-induced hepatitis and HIV-2 infection). Pregnant women can safely take AZT, 3TC and ABC, and this regimen has no drug interactions with rifampicin. Concerns for this triple NRTI regimen relate to antiviral potency, limited data for patients with TB, and hypersensitivity reactions. AZT, 3TC and TDF have no or minimal interactions with rifampicin but efficacy data are limited for patients with TB and hypersensitivity reactions.

Source: WHO Antiretroviral therapy for HIV infection in adults and adolescents : recommendations for a public health approach. – 2006 rev.

Intervention 88: Diagnostics/lab tests

Definition:
All diagnostic tests required for a person before initiation of and while on an ART regimen. Calculated on an annual bas

Population in Need:
All people receiving ART.

Coverage:
Assumed to be same as first-line ART treatment.

Possible Delivery Channels:
Default setting: 50% health center, 50% hospital

Tests and Supplies required Per Person per Year:

Table 16. Recommended minimum frequency of laboratory tests for monitoring in resource-limited settings

Diagnosis and monitoring laboratory tests	Pre-art* (At entry into care)	At initiation of first-line or second-line arv regimen	Every six months	As required (Depending on symptoms)
HIV diagnostic testing	✓		-	-
Haemoglobin [a]		✓	-	✓
WBC and differential [b]	-	✓	-	✓
CD4 cell count [c]	✓	✓	✓	
Pregnancy testing [d]		✓	-	✓
Full chemistry (including, but not restricted to, ALT,[e] other liver enzymes, renal function, glucose, lipids, amylase, lipase, lactate and serum electrolytes) [f]	-	-	-	✓
Viral load measurement [g]	-	-	-	✓

a Haemoglobin monitoring for patients on AZT is recommended at baseline and at weeks 4, 8 and 12 after initiation of AZT.

b Monitoring at week 4, 8 and 12 after initiation of ART is optional.

c Patients who are not yet eligible for ART should be monitored with measurement of CD4 every six months. For patients who develop WHO stage 2 events, or whose CD4 measurements approach threshold values, the frequency of CD4 measurement can be increased. Patients on ART should have CD4 measurement every six months if stable. More frequent CD4 monitoring may be necessary for deciding when to start or switch ART.

d Pregnancy testing for women initiating a first-line regimen containing EFV, and if pregnancy is suspected in women who are receiving an EFV-based regimen.

Source: WHO. Antiretroviral therapy for HIV infection in adults and adolescents : recommendations for a public health approach. – 2006 rev.

Summary of diagnostic requirements

HIV diagnostic testing	1
Hemoglobin	4 for patients on AZT (initiation, week 4,8,12)
WBC and differential	1 at ART initiation (+3 optional week 4,8,12)
CD4 cell count	2 (every 6 months)
Pregnancy test	1 (at initiation)
Full chemistry	As required
Viral load	As required

Average of $190 per year total.
Source: Global Fund

Personnel Time Required per Case per Year:

Number of Visits Required per Case:
2 outpatient visits annually

Intervention 89: Treatment of Opportunistic Infections

Definition:

List of Opportunististic Infections

WHO Stage	OI	Definition
Stage 1: Performance scale - asymptomatic, normal activity		
1	ASY	Asymptomatic
2	PGL	Persistent generalized lymphadenopathy
3	ARI	Acute retroviral infection
Stage 2: Performance scale - symptoms, but nearly fully ambulatory		
4	WL	Unintentional minor weight loss, <10% of body weight
5	MCS	Minor mucocutaneous manifestations (e.g. seborrheic dermatitis, prurigo, fungal nail infections, orophyaryngeal ulcerations, angular cheilitis)
6	HZV	Herpes zoster, within the previous 5 years
7	URTI	Recurrent upper respiratory tract infections (e.g. bacterial sinusitis)
Stage 3: Performance scale - in bed <50% of normal daytime, but > normal, during previous month		
8	MWL	Unintentional major weight loss, >10% of body weight
9	DIA	Chronic diarrhoea, > 1 month
10	PYR	Prolonged fever (intermittent or constant) > 1 month
11	ORC	Oral candidiasis (erythematous or pseudomembranous)
12	HLP	Oral hairy leukoplakia
13	PIB	Pulmonary TB (typical or atypical), within the previous year
14	BAC	Severe bacterial infections (e.g. pneumonia, pyomyositis)
15	VVC	Vulvovaginal candidiasis, chronic (> 1 month) or poorly responsive to therapy
Stage 4: Performance scale - in bed >50% of normal daytime during previous month		
16	CAC	HIV wasting syndrome
17	PCP	Pneumocystis carinii pneumonia
18	TOXO	Toxoplasmosis of the brain
19	CRS	Cryptosporidiosis with diarrhoea
20	ISO	Isosporiasis with diarrhoea, > 1 month
21	CRC	Cryptococcosis, extrapulmonary
22	CMV	Cytomegalovirus disease of an organ other than liver, spleen or lymph node
23	HSV	Herpes simplex virus infection, mucocutaneous (> 1 month) or visceral (any duration)
24	PML	Progressive multifocal leukoencephalopathy
25	MYC	Any disseminated endemic mycosis (e.g. histoplasmosis, coccidioidomycosis)
26	OEC	Candidiasis of the oesophagus, trachea, bronchi or lungs
27	MAI	Atypical mycobacteriosis, disseminated
28	SAL	Non-typhoid Salmonella septicaemia
29	ETB	Extrapulmonary TB
30	LYM	Lymphoma
31	KS	Kaposi's sarcoma
32	ADC	HIV encephalopathy

Population in Need:

HIV-infected population with opportunistic infections. The number of people needing treatment for opportunistic infections is approximated by the number of HIV-positive people in the last one or two years of life, minus those who are on HAART.

HAART is assumed to reduce the incidence of opportunistic infections and, thus, the need for treatment. Number needing OI treatment = new AIDS cases x (1 or 2) – number on HAART x proportion reduction in OI treatment needs when on HAART

Cost per case:

Cost estimates (from GOALS manual):

OI treatment service cost: Half of lifetime OI treatment care is assumed to be delivered through a clinic, and half is delivered through a hospital. **Six lifetime clinic visits for OI treatment are assumed, at a cost of US$6 per visit** (Nandakumar, 2000). **Twenty lifetime days in hospital are assumed, at a cost of US$55 per day** (Gilks et al., 1998). The default values for the drug costs are calculated based on an extensive literature search regarding the frequency of opportunistic infections (OI) and their respective drug treatment costs. The full details of the calculations are presented in Appendix B. Basically, the literature search found 30 different studies from developing countries throughout the world

that contained information on what types of OIs were prevalent. Note that not all OIs were observed in each study. These data were then sorted by OI incidence for each of the 32 OIs that define the four stages of HIV/AIDS, as described in the WHO/UNAIDS guidelines (2000). The cost for treating each OI was derived from either UNAIDS (1998), World Bank (1997), or other sources. A weighted average was then formed to calculate the cost of treating the 14 activities listed in the three treatment levels above. The resulting overall treatment costs are quite similar to those found in World Bank (1997, p. 177), where a similar methodology was used. The costs of treatment for a child are assumed to be some fraction (usually one half to two-thirds) of the costs for an adult.

Other cost estimates
From: Report on the methods used to estimate costs of reaching the WHO target of "3 by 5" January , 2003
http://www.who.int/choice/publications/p_2003_3by5target.pdf

1. Annual OI prophylaxis cost:

a. INH for primary tuberculosis prophylaxis to 19% of adult HIV positive patients recruited from the MTCT/VCT entry points, after exclusion of active TB through X-ray and medical examination (cost of X-ray and examination included).[14]
b. Cotrimoxazole for primary PCP and toxoplasmosis prophylaxis for all adult and paediatric patients.
c. Fluconazole for secondary prophylaxis of cryptococcal meningitis to 1% of adults.[15]

2. Life time OI treatment costs: L
Life time (2 year) cost for all population in need. For patients on ARV, we assumed 10% of this cost to occur prior to initialization of therapy, and 90% during treatment failure under therapy. For those not on ARV, 100% of the cost are incurred during the last two years of life. Incidence data were derived from a review of opportunistic infections in Sub Saharan Africa; drug costs came from the Joint UNICEF/ UNAIDS/WHO/MSF project and from the International Drug Price Indicator Guide 2002, a joint project of WHO and MSH.

Annual number of visits to the health system:
6 visits
Based on information provided in AIM manual.

Annual days of hospitalization:
22 days
Based on information provided in AIM manual.

Intervention 90: Nutritional supplements for first 6 Months

Definition:
Country-specific, needs to be defined by user.

Population in Need:
"The assumption in AIM is that the target population is those newly receiving ART and malnourished, and therefore that supplementation is for six months" (AIM manual]

Coverage:
In AIM assumed to be the same as ART first-lien coverage.

Possible Delivery Channels:
Default setting: 50% clinic, 50% hospital.

Tests and Supplies required Per Person per Year:
User-defined. Default cost $0.

Intervention 91: Cotrimoxazole (children)

Part of LiST impact model

Definition:
Cotrimoxazole for children born to HIV+ mothers from birth until 18 months of age.

Population in Need:

WHO recommends that cotrimoxazole be provided to all children born to HIV+ mothers until their status can be determined. With normal antibody tests a child's a child's HIV status cannot be determined until 18 months of age. Therefore, all children born to HIV+ mothers should receive cotrimoxazole until 18 months. After that cotrimoxazole should be provided to all children who are HIV+. Therefore the need for cotrimoxazole is defined as all children born to HIV positive mothers up to the age of 18 months and all children over 18 months who are HIV positive. If early diagnosis is available then only HIV+ children are considered in need of cotrimoxazole.

- All HIV exposed children (children born to HIV infected mothers) from 4-6 weeks of age (whether or not part of a prevention of mother-to-child transmission [PMTCT] programme)
- Any child identified as HIV-infected with any clinical signs or symptoms suggestive of HIV, regardless of age or CD4 count.

Number of children in need calculated in AIM (AIDS) module of Spectrum model.

Possible Delivery Channels:
Default setting: 50% clinic, 50% hospital.

Drugs and Supplies required Per Child:

- Syrup use is recommended in very young children up to 10-12 kg. Recommended dosages of 6-8 mg/kg once daily should be used.
- Once tablets can be taken, half of a standard adult tablet crushed may be used for children up to 10kg, one whole tablet for 10-25kg, two single strength or one double strength for over 25kg (a usual single strength tablet provides Sulfamethoxazole 400 mg and trimethoprim 80 mg).

Source; http://www.who.int/3by5/mediacentre/news32/en/index4.html

The current cost assumptions are thus:
a) For infants under 12 kg (avg. weight assumed to be 7 kg):
Sulfamethoxazole + trimethropin, oral suspension, 240mg in 100ml – 1x daily 50mg = 20ml or 1/5 of a 100ml bottle a day, at $0.48 per 100ml bottle,
b) For children above 12kg:
Sulfamethoxazole + trimethropin, tablet 400 mg + 80 mg – ½ tablet a day,

Personnel Time Required per Case:
TBD

Intervention 92: ART (for Children)

Definition:
Anti-retroviral treatment for children that are HIV+

Population in Need:
HIV-positive children who have progressed to moderate-to-severe HIV disease. (Number of children in need calculated in AIM (AIDS) module of Spectrum model)

Possible Delivery Channels:
Default setting: 50% clinic, 50% hospital.

Drugs and Supplies required Per Child:

Drug/Supply	Percent receiving this aspect of the treatment	Note	Number of units	Times per day	Days per case	Units per case
AZT (60mg) + 3TC (30mg) + NVP (50mg)	10	0-11 months, non-NVP exposed	2	1	365	730
AZT 10mg/ml +3TC 10mg/ml +LPV/r (80 +20 mg/ml)	5	0-11 months, NVP exposed	1	2	365	730
AZT (60mg) + 3TC (30mg) + NVP (50mg)	10	12-23 months	4	1	365	1460
AZT (60mg) + 3TC (30mg) + NVP (50mg)	25	24-59 months	5	1	365	1825
AZT (60mg) + 3TC (30mg) + NVP (50mg)	17	60 months -7 years, 11 months	6	1	365	2190
AZT (300mg) + 3TC (150mg) + NVP (200mg)	33	8 years -14 years, 11 months	1	2	365	730

Personnel Time Required per Case:
By default, the model assumes monthly visits, for ten minutes each.

COLLABORATIVE HIV/TB INTERVENTIONS

Intervention 93: Screen HIV+ cases for TB

Intervention 94: Isoniazid Preventive Therapy for HIV+ (IPT)

Intervention 95: Care and support for TB HIV+ Patients

Intervention 96: Cotrimoxazole preventive therapy

Intervention 97: VCT for TB cases

Intervention 98: ART (+CPT) for TB HIV+ patients

Vaccination

Intervention 99-107. Vaccinations

Intervention 99: Rotavirus (2-3 doses)

Intervention 100: Measles (2 doses)

In countries where the incidence and mortality from measles is high in the first year of life, the recommended age for immunization against measles is at 9 months of age (270 days) or shortly after. The second dose can be given at least one month after the first dose through routine or supplemental activities. Measles vaccine can be given safely and effectively simultaneously with DTP, Td, TT, BCG, polio (OPV and IPV), haemophilus influenzae type b, hepatitis B, and yellow fever vaccines and vitamin A supplementation.

Intervention 101: Hib (3 doses)

In general, a three dose primary series is given at the same time as the primary series of DTP. The first dose is given to children at 6 weeks of age or older, and the second and third are given at 4-8 week intervals along with DTP.

Intervention 102: DPT (3 doses)

In countries where pertussis is of particular danger to young infants, DTP immunization should be started as soon as possible with the first dose given as early as 6 weeks, and two subsequent doses given at 4-week intervals. DTP vaccine can be given safely at the same time as other EPI vaccine according to national immunization schedules.

Intervention 103: Pneumococcal (3 doses)

Intervention 104: Polio (3 doses)

Infants should receive at least three doses of OPV at minimum intervals of 4 weeks. WHO recommends the following schedule in endemic countries: Birth, 6, 10, 14 weeks. In non-endemic areas the first dose can be given from 6 weeks with the first dose of DTP. OPV can be given safely and effectively at the same time as measles, rubella, mumps, DTP, DT, TT, Td, BCG, hepatitis B, haemophilus influenzae type b, yellow fever vaccine and vitamin A supplementation.

Intervention 105: BCG (1 dose)

BCG should be given routinely to all infants at risk of early exposure to the disease. For maximum protection, this vaccine should be given as soon after birth as possible. It can be given at the same time as DTP, measles, polio (OPV and IPV), hepatitis B, haemophilus influenzae type B, yellow fever vaccines and vitamin A supplementation.

Intervention 106: Penta Vaccine (3 doses)

Vaccine used to prevent five diseases, diphtheria, tetanus, pertussis (whooping cough), hepatitis B and poliomyelitis (polio). 3 doses, one at 2, 4,and 6 months of age. This takes the place of those individual vaccines.

Population in Need:

Default assumption that all children need these vaccines.

Possible Delivery Channels:

The default assumption is that most vaccine are delivered through routine immunization (during regular sick/well child visits); some vaccines such as measles and polio are also delivered through campaigns (Hib and pneumococcal vaccine could also have a kickstart through campaigns).

The below show the default assumptions of the model, it is expected that countries will adjust theses percentages to match local policy.

	% of children receiving vaccination at/through						
	Rotavirus	**Measles**	**Hib**	**DPT**	**Pneumoc.**	**Polio**	**BCG**
Routine Immunization (during sick/well child visits etc.)	100%	50%	100%	100%	100%	50%	100%
Campaigns/outreach		50%				50%	

Drugs and Supplies required Per Child:

The following shows vaccine prices used in the model. They were taken from the most recent UNICEF catalogue price list (as of March 2009). It was assumed that 1 box could be used for 100 used needles.

Rotavirus

Rotavirus vaccine 3 doses at $1.66 each (Source: UNICEF/GAVI)

Measles vaccine

2 doses at $0.24 each + reconstitution needle+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes (1 box per 100 used needles)

UNICEF S359163 Measles vaccine,vial of 10 doses $2.40

50% wastage

Hib Vaccine

3 doses at $3.40 each + reconstitution needle+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes

50% wastage

UNICEF S359427 Hib vaccine ,liquid,vial of 10 doses $22.25

DPT Vaccine
3 doses at $.14 each +auto-disposable syringe, 0.5ml, with needle + safety box for used syringes
UNICEF S359124 DTP vaccine, adsorbed,vial of 20 doses $2.82

Pneumococcal Vaccine
3 doses at $3.50 each + prequalified liquid plus delivery system+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes . Countries not eligible for GAVI will need to use a unit cost of $7 (non-subsidized price),
Price quotes: PAHO revolving fund $10, UNICEF GAVI $7 for 2 doses

Polio Vaccine
3 doses at $0.17 each
UNICEF S359183 Oral Polio Vaccine,vial of 10 doses $1.78

Outreach, door to door campaigns

BCG Vaccine
3 doses at $0.11 each + reconstitution needle+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes
Wastage 50%
UNICEFS359114 BCG vaccine, vial of 20 doses $2.12

HPV Vaccine
3 doses at 8.25 each. plus delivery system+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes

Personnel Time Required per Case:

For clinic-based delivery, the model assumes that each routine immunization takes 2 minutes of a doctor/nurse's time. Outreach administration is assumed to take 4 minutes (adjusting the clinic estimate upward to account for the travel time involved in outreach)
IVB recommendations on maximum number of children to immunize

The following shows current default assumptions for immunization outreach/campaigns: (These assumptions can be changed by the user but the goal is to provide some reasonable default assumptions)

	Immunization Outreach
Transportation Cost per day of outreach	$10.00
Time spent on getting to outreach site and back (min)	90
Number of children immunized per outreach session	100
Avg. number of immunizations per child[7]	2
Number of staff on immunization team	3

Other Costs:

In order to keep the costing of immunization compatible with the costing of the other interventions we will not be including major capital costs such as facilities, refrigerators, etc. This are assumed to be in place. Programme management costs will be included as a % add-on.

Minor equipment
To be included under program costs.

Item	Supplier	Code	Cost per Pack	Units per Pack	Cost per Unit
Vaccine cold box,large,long range	UNICEF	1185020	$170.35	1	$170.35
Vaccine carrier,storage capacity 1.5-3L	UNICEF	1185040	$12.26	1	$12.26
Safety box for used syringes/needles, 5 liter	UNICEF	0782208	$15.67	25	$0.63
Icepack,0.6 litre capacity	UNICEF	0002221	$15.12	24	$0.63

Intervention 107: HPV Vaccine

Definition:

[7] *Estimate from WHO CHCET tool.*

Vaccination against diseases caused by human papillomaviruses (HPVs), mainly cancers of the cervix, but also including cancer of the vagina, vulva, penis and anus; a subset of head and neck cancers; anogenital warts; and recurrent respiratorypapillomatosis.

Population in Need:
Girls age 11

Possible Delivery Channels:
School-based.
Default: 50% campaign/outreach, 50% clinic-based.

Drugs and Supplies required Per Case:
3 doses of the HPV vaccine (baseline, again after 2 months and 6 months). Brand name Gardasil.

HPV Vaccine
3 doses at 8.25 each. plus delivery system+auto-disposable syringe, 0.5ml, with needle + safety box for used syringes

Personnel Time Required per Case:
For clinic-based delivery, the model assumes that each routine immunization takes 2 minutes of a doctor/nurse's time.

Number of Visits Required:
3 visits.

WATER AND SANITATION (WASH)

Intervention 108: Use of improved water source within 1 km AND

Intervention 109: Use of water connection in home

Definition:
The Joint Monitoring Programme defines access to water supply and sanitation in terms of the types of technology and levels of service afforded
Access to **water-supply services** is defined as the availability of at least 20 litres per person per day from an "improved" source within 1km of the user's dwelling. An **"improved"** source is one that is likely to provide "safe" water, such as a

- public standpipe
- borehole
- protected dug well
- protected spring
- rainwater collection
- household connection

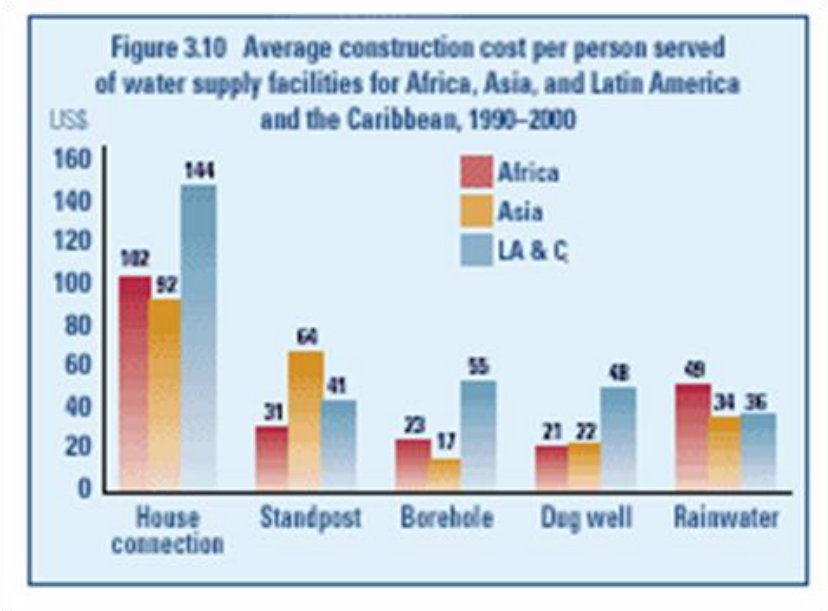
The first five improved sources are part of intervention 22, the last one, "household connection' is covered by intervention 23.

Population in Need:
All households.

Costs:
The model differentiates between the cost of construction and maintenance of the water facilities incurred by the Ministry of Water and Sanitation and shown separately – and the recurrent costs borne by the Ministry of Health (the cost of regulation, monitoring, promotion and advocacy).

The graph below shows **average construction costs** for different types of improved water supply facilities[8]. The variations between regions are to some extent the result of differing water resource endowment, differing unit costs for construction in general, and differing levels of service offered. The figures should be considered rough estimates. They may vary widely because costs will be significantly affected by factors such as population density and ease of access of water sources.

[8] *WHO/Unicef 2000. Water Supply & Sanitation Global Assessment; Year 2000 Report. Geneva: WHO and Unicef*



For public water points, corresponding to "improved" water supply, hydrogeological and other constraints mean that the cheapest technology is not feasible in every community. A construction cost figure of $40 per capita is around the middle of the range offered by different technologies (standpost, borehole and dug well) providing this level of service for each continent, and therefore seems reasonable for this level of service, though it can be expected to vary between $15 and $65 or more, depending on local conditions.

For household connections, the average construction cost is in the $90 - $140 area.
Construction costs do not represent the full cost of water supplies. The Global Assessment[9] gives median reported production costs per cubic meter for urban (house connection) water supplies as $0.20 for Asia and $0.30 for Africa and Latin America which result in annual per capita **operating and maintenance costs** of $7.30 and $10.95, respectively, or 8-10% of the total capital cost of construction.

Reliable figures for the annual maintenance costs for rural water supplies are harder to find since much of the maintenance is carried out by volunteer labor of villagers. Cairncross suggests a nominal annual figure of $1.00 per capita based on a number of studies reviewed. This represents 2.5% of the construction cost derived above.

Since the construction of water and sanitation-related facilities is usually the responsibility of the Ministry of Water and Sanitation, the water and sanitation supply is a health-related intervention which comes essentially "free" to the budgets of the health sector. The function of the health sector is one of **regulation , advocacy** and provision of supplementary inputs where appropriate to ensure that potential health benefits of water supply are realized to the optimal extent. The role the health sector plays in **drinking water quality surveillance** is well-known. Where that role is not available to the health sector, advocacy (for instance, for lower connection charges) can be just as effective. The units costs of such regulation and advocacy are minimal. Cairncross suggests a cost figure of 1% of capital costs or $0.02 to $0.10 per capita for these activities.

Based on the above, the model uses the following default values (which can be changed/modified by the user if desired) :

	Construction Cost (borne by W&S department)	**Operating and Maintenance (borne by W&S department)**	**Regulation and advocacy (borne by Ministry of Health)**
Africa	$31	Between 2.5% (rural areas) and 10% (urban areas) of construction cost depending on rural/urban distribution of water facilities	1% of capital costs
Asia	$34		
Latin America	$45		

For intervention 23 (household connection), the default values are:

	Construction Cost (borne by W&S department)	**Operating and Maintenance (borne by W&S department)**	**Regulation and advocacy (borne by Ministry of Health)**
Africa	$102	Between 2.5% (rural areas) and 10% (urban areas) of construction cost	1% of capital costs
Asia	$92		

[9] *WHO/Unicef 2000. Water Supply & Sanitation Global Assessment; Year 2000 Report. Geneva: WHO and Unicef*

Latin America	$141	depending on rural/urban distribution of water facilities	

Intervention 110: Improved sanitation – utilization of latrines or toilets

Definition:

Improved/hygienic excreta disposal =access to improved latrine or flush toilet

Access to adequate sanitation facilities is the percentage of the population using "improved" sanitation

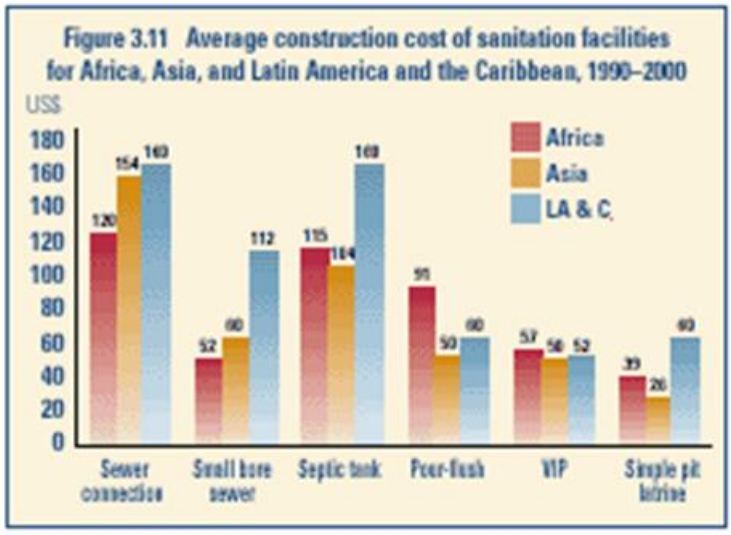
Improved	Not improved
> connection to a public sewer	> public or shared latrine
> connection to a septic system	> open pit latrine
> pour-flush latrine	> bucket latrines
> simple pit latrine	
> ventilated improved pit latrine	

Population in Need:

All households.

Costs:

The figure below shows the median regional construction costs per capita of the various sanitation technologies found by the WHO/UNICEF 2000 Global Assessment. While simple on-site systems tend to be cheaper than systems such as sewerage and septic tanks, the difference is sometimes less than might be expected. There is still a need for less costly sanitation facilities that meet the needs of the poor. The provision of such facilities is also important in protecting public health. Because the level of facilities associated with the indicated costs are not clear, the average costs presented should be used with caution.



The Disease Control Priorities project in its cost-effectiveness calculations uses a construction cost of $60 per capita considered adequate for basic sanitation facilities (a household pit latrine, VIP latrine or a pour-flush toilet) in any region of the developing world. That said, it should be borne in mind that substantially cheaper solutions are often feasible, such as the "15 Taka latrine" (costing only US$ 0.27 per household) developed in Bangladesh, which includes a pour-flush pan made of tin sheet, and an odor- and insect-proof seal made of flexible plastic pipe.

Cairncross suggests a $2.50 per capita cost for **promotional activities** based on two very successful and well-run promotion programs in Bangladesh and Zimbabwe.

Based on the above, the model uses the following default values (a straight average of the six technologies presented above) for intervention 24. It is assumed that the user will modify the number based on the type(s) of sanitation facilities planned to be constructed by the country.

	Construction Cost (borne by W&S department)	Operating and Maintenance	Promotional activities (borne by Ministry of Health)
Africa	$79	Minor cleaning costs, negligible	$2.50 per capita
Asia	$74		
Latin America	$101		

Intervention 111: Handwashing with Soap

Definition:
"Appropriate" hand washing behavior includes time of washing - after handling feces and before food preparation; and the technique used - using soap, ash or other aid, for long enough, using clean water

Population in Need:
All children and their caretakers = all households.

Costs:
Cost of soap is not included as it is assumed to be borne by the household

There are very few cases where the costs as well as the effectiveness of hygiene promotion programs have been documented objectively. In the absence of suitable data, Varley et al. (1998) calculated a costing for a typical programs from first principles, arriving at a cost of $3 (range $2 - $3) per household per year, or $0.60 per head of population. Two other studies, in Burkina Faso (2002) and Zimbabwe (2003) point to an average cost per capita of handwashing promotion programs between $0.65 and $0.67 per head of population covered.
Source: Sandy Cairncross. July 2004. Water Supply, Sanitation, and Hygiene Promotion. Disease Control Priorities Project, Working Paper No. 28

Default cost used by the model: **$0.90 per person covered** (2002/3 values adjusted for inflation)

Intervention 112: Hygienic removal of children's stool

Definition:
If human faeces are left uncontained, disease may spread by direct contact or by animal contact with the faeces. Hence, the proper disposal of children's stools is extremely important in preventing the spread of disease. Hygienic disposal consists of either a child using a toilet or latrine, a child's stool either being disposed of in a toilet or latrine or buried. Stool that is left uncontained, put or rinsed into a drain or ditch or thrown into the garbage is considered unhygienic.

Population in Need:
Same as Intervention 25 – handwashing.

Costs:
Default cost used by the model: **$0.90 per person covered** (2002/3 values adjusted for inflation)
If both Intervention 25 and 26 are implemented at the same time, cost can be shared (two messages on one poster, etc.)

NUTRITION

The nutrition module assumptions document elaborates on the detailed cost per case managed for the intervention costing. It includes information on

- Case management guidelines used (WHO guidelines are available in the eLENA website)
- "Target group" and "population in need" (based on WHO guidelines)
- Information on types, quantities and prices of "drugs and medical supplies" that are needed to estimate the cost of intervention per average (included under the detailed "treatment inputs" in the software)
- Estimated time of "medical personnel" involved in implementing the intervention
- Number of "outpatient visits and inpatient days"
- Suggestions to items that need to be included under "programme costs, e.g. IEC, administration, M&E surveys, in-service training, programme staff, etc., as would be needed for the specific health and nutrition programme to support the scale-up of direct care interventions. This is also where some of the policy - related activities can be costed, such as activities related to legislation and regulation.

The nutrition module assumptions document describes in detail the inputs need to implement the effective direct nutrition interventions that can be expanded for delivery through the health system (e.g. iron-folic acid supplementation to women, breastfeeding promotion, etc).
It further describes effective health interventions with an impact on nutrition, which may or may not be part of the planning budget of the nutrition programme (e.g. deworming, delayed cord clamping, pregnancy spacing, etc.). The nutrition programme managers should be aware of these interventions and their synergies with the more direct interventions.
Finally, the nutrition module includes certain interventions that often are not implemented through the health sector (e.g. wheat flour fortification), but which would be part of a multisectoral nutrition plan.

Women of reproductive age and adolescent girls

Intervention 113: Intermittent iron and folic acid supplementation for menstruating women

Definition:
Worldwide there are approximately 469 million anaemic women (30%) with at least half the cases being due to iron deficiency. Intermittent iron and folic acid supplementation is recommended as a public health intervention in menstruating women living in settings where anaemia is 20% or higher, to improve their haemoglobin concentrations and iron status and reduce the risk of anaemia (*strong recommendation*)1.(WHO guideline: Intermittent iron and folic acid supplementation in menstruating women 2011, http://www.who.int/entity/elena/titles/iron_women/en/index.html).

The international recommendation for weekly supplementation for non-pregnant women of reproductive age is that supplements should contain 60 mg of elemental iron (300mg ferrous sulphate, 180mg ferrous fumarate or 500mg ferrous gluconate) and 2800 µg (2.8mg) of folic acid. Although evidence for the effective dose of folic acid for intermittent supplementation is very limited, the current recommendation is based on the rationale of providing seven times the recommended daily dose to prevent neural tube defects (NTDs) and the experimental evidence that high weekly doses can improve red blood cell folate concentrations to levels that have been associated with a reduced risk of NTDs.

Duration and time interval between periods of supplementation: 3 months of supplementation followed by 3 months of no supplementation after which the provision of supplements should restart.

Population in need:
All menstruating women living in settings where anaemia is 20% or higher.
(www.who.int/vmnis/publications/anaemia_prevalence/en/) - a proxy estimation can be made using women of reproductive age.

Possible delivery channels:
This intervention could be delivered through various channels, e.g. at hospital and clinic facilities or also through outreach or at community level. In some countries sale of the combined tablets by private sector is available.

	% of cases receiving treatment
Community Level	30%
Outreach	10%
Clinic	50%
Hospital	10%

Supplies required per person
The recommended dosages are currently less available internationally, but work is underway to include drugs in the right dosages to Essential Medicines Lists (EMLs). In the meantime, the default costs in the OneHealth Tool provides less folic acid than recommended:

1 tablet 60 mg iron and 0.4 mg folic acid per week for 2x3 months per year. Using UNICEF S1550025 Fe(as fum)+folic 60+0.4mg tab/PAC-1000 at USD 5.07, cost per woman per year = USD 0.12

Personnel/Time required per case
5 minutes of a nurse's/hospital, clinical pharmacist's or community health workers time by 2 visits/year.

Pregnant and lactating women

Intervention 114: Daily iron and folic acid supplementation in pregnant women

Definition:
Pregnant women, especially if starting the pregnancy with marginal stores, have increased needs for several micronutrients, and particularly iron and folic acid, which in most settings will not be met by diet. Iron deficiency anaemia in pregnant women, especially if severe, increases the risk of death for the mother from bleeding and poor stores in the neonate.

The international recommendation for daily supplementation for pregnant women that supplements should contain 30-60mg of elemental iron (30 mg of elemental iron equals 150mg ferrous sulphate, 90mg ferrous fumarate or 250mg ferrous gluconate) and 400 µg (0.4mg) of folic acid (WHO 2012 guideline).
However, if a woman is diagnosed with anaemia in a clinical setting, she should be treated with daily iron (120 mg of elemental iron) and folic acid (400 µg or 0.4 mg) supplementation until her haemoglobin concentration rises to normal . She can then switch to the standard antenatal dose to prevent recurrence of anaemia. (WHO 2012 guideline, http://www.who.int/entity/elena/titles/daily_iron_pregnancy/en/index.html).

Population in Need:
All pregnant women in all settings.

Possible Delivery Channels:
During ANC (antenatal care) visits through community health workers at community level, through clinics and clinic outreach. Community could include social marketing interventions encouraging women to buy the supplements through private sector outlets, including small rural stores.

Default assumptions used in the model (can and should be changed by the user to reflect local programming and circumstances):

	% of cases receiving treatment
Community Level	50%
Outreach	0%
Clinic	25%
Hospital	25%

Drugs and Supplies required Per Woman:

By default the OneHealth Tool uses iron-folic acid supplementation most widely used in countries, which cover the upper end of the recommended iron dose:
1 tablet 60 mg iron and 0.4 mg folic acid per day for 6 months per pregnancy*. Using UNICEF S1550025 Fe(as fum)+folic 60+0.4mg tab/PAC-1000 at USD 5.07, cost per woman per pregnancy = USD 0.91

In addition to iron and folic acid, supplements may be formulated to include other vitamin and minerals according to the United Nations Multiple Micronutrient Preparation to overcome other possible maternal micronutrient deficiencies. The lower end of the recommended dose (30 mg iron) is available through multiple micronutrient tablets.
Countries choosing the lower iron dose through multiple micronutrients tablets need to review any other supplementation schemes provided to pregnant women. The cost of using MN tablets is:
1 tablet which includes. 30 mg iron and 0.4 mg folic acid per day for 6 months per pregnancy*. Using S1580100 Micronutrient ,film-coated tabs/PAC-1000 at USD 16.56, cost per woman per pregnancy = USD 2.98

It should be noted that in settings where anaemia in pregnant women is a severe public health problem (40% of higher), a daily dose of 60 mg of elemental iron is preferred over a lower dose

For a woman assessed as anaemic, she should get 120 mg iron until her haemoglobin concentration rises to normal, then switching back to the normal daily dose. Assuming 2 x tablet 60 mg iron and 0.4 mg folic acid per day for 3 months and 1 x tablet 60 mg iron and 0.4 mg folic acid per day for another 3 months of the total of 6 months per pregnancy*. Using UNICEF S1550025 Fe(as fum.)+folic 60+0.4mg tab/PAC-1000 at USD 5.07, cost per anaemic woman per pregnancy = USD 1.37

*Although ANC ideally takes place within the first trimester, many women experience vomiting during the first 3 months and supplementation would then be less effective. In countries where first ANC visit usually takes place later than at 3 months, the planned treatment scheme of the intervention should be adapted.

Personnel Time Required per Case:
4 visits, requiring about 2 minutes each for actual distribution of supplements beyond the 10 min basic ANC covered in Intervention.

The percentage buying from shops and pharmacies (and so no personnel time required) will vary with the country but has reached high levels in many countries e.g. Indonesia, Philippines and in Latin American countries, but usually as part of a specific push.

Intervention 115: Intermittent Iron and Folic Acid Supplementation in non-anaemic pregnant women

Definition:
Iron and folic acid supplementation for pregnant women - once, twice or three times a week on non-consecutive days can be an alternative to daily supplementation in areas where anaemia is not prevalent. Intermittent supplementation possibly enhances absorption, and reduces oxidative stress and the other side-effects of daily supplementation. Experience has shown that intermittent regimens may be more accepted by women, with increased adherence to supplementation programmes (WHO Guideline 2012, http://www.who.int/entity/elena/titles/intermittent_iron_pregnancy/en/index.html).

The international recommendation for weekly supplementation for non-pregnant women of reproductive age is that supplements should contain 120 mg of elemental iron (in the form of ferrous sulphate 600 mg, ferrous fumarate 360 mg or ferrous gluconate 1000mg) and 2800 µg of folic acid.

Population in Need:
All non-anaemic pregnant women (Haemoglobin concentrations should be measured prior to the start of supplementation to confirm non-anaemic status).

Possible Delivery Channels:
During ANC visits (following delivery channel distribution specified under ANC).

	% of cases receiving treatment
Community Level	10%
Outreach	0%
Clinic	60%
Hospital	30%

Drugs and Supplies required Per Woman:
The recommended dosages are currently less available internationally, but work is underway to include drugs in the right dosages to Essential Medicines Lists (EMLs). In the meantime, the default cost in the OneHealth Tool based on taking two tablets weekly provides the right iron dose but less folic acid than recommended:
2 x 1 tablet 60 mg iron and 0.4 mg folic acid per day for 6 months per pregnancy*. Using UNICEF S1550025 Fe(as fum.)+folic acid: 60+0.4mg tab/PAC-1000 at USD 5.07, cost per woman per pregnancy (6 months, 30 days/month) = USD 1.82

*Although ANC ideally takes place within the first trimester, many women experience vomiting during the first 3 months and supplementation would then be less effective. In countries where first ANC visit usually takes place later than at 3 months, the planned treatment scheme of the intervention should be adapted.

Personnel Time Required per Case:
2 minutes of a nurse's time x 4 visits for actual distribution of supplements beyond the 10 min basic ANC covered in Intervention.

Other costs:
Hemocue for assessing anaemia

Intervention 116: Vitamin A supplementation in pregnant women

Definition:
Vitamin A supplementation for pregnant women for the prevention of nightblindness, only in areas with a severe public health problem related to vitamin A

Population in need:
Vitamin A deficiency affects about 19 million pregnant women, mostly in Africa and SE Asia. As vitamin A during pregnancy is essential for the health of the mother and health and development of the foetus, there is a strong recommendation to supplement pregnant mothers living in areas with a severe public health problem i.e. populations where the prevalence of nightblindness is ≥ 5% in pregnant women or ≥5% in children 24-59 months of age (see whqlibdoc.who.int/publications/2009/9789241598019_eng.pdf for countries) to avoid nightblindness (WHO guidance. Vitamin A supplementation in pregnant women. 2011, http://www.who.int/entity/elena/titles/vitamina_pregnancy/en/index.html).

There is however also a strong recommendation that vitamin A supplementation not be part of routine antenatal care for the prevention of maternal and infant morbidity and mortality. Similarly, postpartum vitamin A supplementation is not recommended (WHO guideline. Vitamin A supplementation in postpartum women. 2011, http://www.who.int/entity/elena/titles/vitamina_postpartum/en/index.html). Similarly vitamin A supplementation in HIV-positive pregnant women is strongly not recommended as a way of reducing MTCT of HIV (WHO guideline. Vitamin A supplementation in pregnancy for reducing the risk of mother-to-child transmission of HIV. 2011, http://www.who.int/entity/elena/titles/vitamina_hiv_pregnancy/en/index.html).

Possible delivery channels:

	% of cases receiving treatment
Community Level	40%
Outreach	0%
Clinic	50%
Hospital	10%

Drugs and supplies required per woman:
The recommendation provides two options, either 10,000 IU daily or 25,000 IU weekly supplementation for a minimum duration of 12 weeks.

The default in the OneHealth Tool is set at daily supplementation of 1 tablet 10,000 IU vitamin A daily for 12 weeks per pregnancy. Using MSH International drug price calculator unitary cost of 10,000 IU vitamin A at 0.0114 USD/pill, cost per woman per pregnancy (for 12 weeks, 7 days/week) = USD 0.96

Alternatively, countries may opt for weekly supplementation of 1 tablet 25,000 IU vitamin A weekly for 12 weeks per pregnancy. Using MSH International drug price calculator unitary cost of 25,000 IU vitamin A at a medium price range cost of 0.1155 USD/pill (lower range is 0.0758 USD/pill), cost per woman per pregnancy (for 12 weeks) = USD 0.91

Personnel time required per case:
5 minutes of nurse's time as part of regular ANC visits. Minimal in-service training is required.

Intervention 117: Calcium supplementation in pregnant women for the prevention and management of pre-eclampsia/eclampsia

Definition:
Calcium supplementation (daily tablets) for pregnant women.
According to a Cochrane review, calcium supplementation appears to almost halve the risk of pre-eclampsia, and to reduce the rare occurrence of the composite outcome 'death or serious morbidity'. WHO has made a series of recommendations to prevent and treat pre-eclampsia and eclampsia (WHO guidelines: Calcium supplementation

in pregnant women, 2013; Prevention and treatment of pre-eclampsia and eclampsia. 2011, http://www.who.int/entity/elena/titles/calcium_pregnancy/en/index.html).

Population in Need:
All pregnant women could benefit from calcium supplementation (100%), especially for high-risk women and for those with low dietary calcium intake. Hypertensive disorders affect about 10% of all pregnant women globally. About 5-8% of women with pre-eclampsia will present with eclampsia in low-and middle-income countries (WHO 2011).

Possible Delivery Channels:
Provision during antenatal care visits (current default setting 100% clinic, can be changed by the user).

	% of cases receiving treatment
Community Level	0%
Outreach	0%
Clinic	100%
Hospital	0%

Drugs and Supplies required Per Person:
3 x 1 tablet 600 mg calcium per day for 6 months per pregnancy*. Using MSH International drug price calculator unitary cost of 600 mg calcium at 0.0213 USD/pill, cost per woman per pregnancy (6 months, 30 days/month)= USD 11.50

Since calcium inhibits absorption of iron, calcium supplementation should be separated in time during the day from the recommended iron +folic acid supplementation

**Although ANC ideally takes place within the first trimester, many women experience vomiting during the first 3 months and supplementation would then be less effective. In countries where first ANC visit usually takes place later than at 3 months, the planned treatment scheme of the intervention should be adapted.

Personnel Time Required per Case:
2 minutes x 4 ANC visits for actual distribution of supplements beyond the 10 min basic ANC.

Intervention 118: Nutritional care and support for HIV-infected pregnant and lactating women

Definition:
People living with HIV need appropriate nutritional care and support as a part of the global care and to prevent or manage undernutrition. Care of pregnant and lactating women includes ART for pregnant women and diet to ensure additional energy intake (an additional 10% for the HIV-infected and higher percentage for those who are undernourished) (http://www.who.int/elena/titles/nutrition_hiv/en/index.html).

Population in Need:
HIV-infected pregnant and lactating women (including adolescents).

Possible Delivery Channels:
During routine ANC and other visits to the health system, at delivery and during post-natal care, at a facility or at the community level, including HIV clinics.

	% of cases receiving treatment
Community Level	15%
Outreach	25%
Clinic	50%
Hospital	10%

Drugs and Supplies required Per Women:

ART is not included in this cost estimation, see interventions in HIV module.

There is currently no evidence-based guideline to support the use of supplementary food in all HIV positive pregnant or lactating women. Such intervention should be based on individual assessment.

Personnel Time Required per Case:
10 minutes of a nurse/nutrition nurse at the clinic to assess dietary intake and provide nutritional counselling for achieving appropriate dietary intake.

Intervention 119: Nutritional care and support of pregnant and lactating women in emergencies

Definition:
Micronutrient deficiencies can easily develop during an emergency or be made worse if they are already present. This happens because livelihoods and food crops are lost; food supplies are interrupted; diarrhoeal diseases break out, resulting in malabsorption and nutrient losses; and infectious diseases suppress the appetite whilst increasing the need for micronutrients to help fight illness. For these reasons it is essential to ensure that the micronutrient needs of people affected by a disaster are adequately met. For this to happen it is critical that general food-aid rations are adequate and well balanced to meet nutrient needs, and that they are distributed regularly and in sufficient quantities.
One way to meet the recommended daily intake of micronutrients is to provide foods fortified with micronutrients. Fortified foods, such as corn-soya blend, biscuits, vegetable oil enriched with vitamin A, and iodized salt, and lipid-based products, are usually provided as part of food rations during emergencies. The aim is to avert micronutrient deficiencies or prevent them from getting worse among the affected population. Such foods must be appropriately fortified, taking into account the fact that other unfortified foods will meet a share of micronutrient needs.
However, foods fortified with micronutrients may not meet fully the needs of certain nutritionally vulnerable subgroups such as pregnant and lactating women, or young children. For this reason UNICEF and the WHO have developed the daily multiple micronutrient formula shown in Table 1 to meet the recommended nutrient intake (RNI) of these vulnerable groups during emergencies. (WHO/UNICEF/WFP. Joint statement on preventing and controlling micronutrient deficiencies in populations affected by an emergency. 2007)
Pregnant and lactating women should be given this supplement providing one RNI of micronutrients daily, whether they receive fortified rations or not .

Table 1. The composition of multiple micronutrient supplements for pregnant women, designed to provide the daily recommended intake of each nutrient i.e. one RNI (WHO/UNICEF/WFP. Joint statement on preventing and controlling micronutrient deficiencies in populations affected by an emergency. 2007).

Micronutrients	**Pregnant women**
Vitamin A µg	800
Vitamin D µg	5.0
Vitamin E mg	15.0
Vitamin C mg	55.0
Thiamine (vitamin B1) mg	1.4
Riboflavin (vitamin B2) mg	1.4
Niacin (vitamin B3) mg	18.0
Vitamin B6 mg	1.9
Vitamin B12 µg	2.6
Folic acid µg	600.0
Iron mg	27.0
Zinc mg	10.0
Copper mg	1.15
Selenium µg	30.0
Iodine µg	250.0

Population in Need:
All pregnant and lactating women in emergency situations.

Possible Delivery Channels:
100% Special Emergency Clinics set-up for the emergency (at least initially). During ANC visits for pregnant women and infant health check for lactating women (following delivery channel distribution specified under the special circumstances e.g. a refugee camp).

Drugs and Supplies required Per Woman:
Pregnant and lactating women should receive 1 RNI of the multimicronutrient supplement as above whether they are also receiving fortified food rations or not (WHO/WFP/UNICEF 2007). Similarly if getting iron and folic acid supplements, these should continue.

Using UNICEF S1580100, 1000 tablets at $16.56 multiple micronutrient supplementation for pregnant women (micronutrient profile similar but not equal to above) for treatment period of 6 months during pregnancy and 6 months during lactation = total 12 months of treatment, equals 2.98 USD per pregnant woman and 2.98 USD per lactating woman

The cost of food rations or supplementary foods (both of which should be fortified) are not included here as often not part of health sector budget.

Personnel Time Required per Case:
In addition to ANC or infant check-ups, 2 minutes of a nurse's time x 4 visits .

Intervention 120: Iodine supplementation during pregnancy and lactation

Definition:
Universal salt iodization (USI) remains the prime intervention as it is safe, cost-effective and sustainable (WHO/UNICEF. Joint statement on reaching optimal iodine nutrition in pregnant and lactating women and young children. 2007, http://www.who.int/entity/elena/titles/iodine_pregnancy/en/index.html). However, the most susceptible groups – pregnant and lactating women and children <2 years of age may not be adequately covered by iodized salt where USI is not fully implemented and therefore need supplementation.

Population in Need:
All women of reproductive age and children between 6 and 23 months of age should have access to adequately iodized salt. In countries, or areas within countries, in which 20-50% of the households have access to iodized salt, or <20%, then these countries need to assess their USI strategy and programme. If it does not succeed in scaling-up after 2 years, then supplementation needs to be considered, and especially in the <20% USI group of countries, supplementation needs to be implemented (WHO/UNICEF 2007). Coverage of salt iodization in countries can be found at NLIS country profiles (www.who.int/nutrition/nlis) which draws data from UNICEF ChildInfo (www.childinfo.org/idd_profiles.php).

Delivery Level:
USI is delivered through the private sector (although some countries have targeted supplies of iodized salt for vulnerable groups such as the lowest socio-economic groups). Where supplementation is required, it will be 100% though clinics.

Drugs and Supplies required

Population group	Daily iodine supplement dose (µg/d)	If given a single annual dose (mg/y)
Pregnant women	250	400
Lactating women	250	400
WRA (15-49y)	150	400
Children (<2 y)	90	200

Women, annual supplementation
2 x 1 tablet 200mg iodized oil capsules per year. Using UNICEF S0000200 Iodized oil 200mg caps/PAC-1500 at USD 345.69, cost per woman per year = USD 0.46

Personnel Time required per mother and child:
5 minutes to distribute supplements
Promotion of the use of iodized salt

Adults

Intervention 121: Care for adults with low body mass index (i.e. BMI < 16 kg/m2)

Definition:

Body mass index below 16 Kg/m2 indicates severe thinness in adults. This may occur as a primary disorder in adolescents and adults in conditions of extreme privation and famine, or is commonly associated with other illnesses, including AIDS. In such cases both the malnutrition and the underlying illness must be treated, and this intervention is therefore often implemented in combination with nutritional care of HIV-infected pregnant and lactating women, nutritional care of pregnant and lactating women in emergencies and preventive treatment of malaria. In pregnancy, maternal underweight is important to prevent and to treat as gestational weight gain is positively associated with foetal growth (Kramer MS, Kakuma R. Energy and protein intake in pregnancy (Cochrane Review, 2010).

BMI classification

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the height in metres squared (kg/m^2). E.g. an adult who weighs 70kg and whose height is 1.75m will have a BMI of 22.9 (BMI = 70 kg / (1.75 m^2) = 70 / 3.06 = 22.9

Table 1: The International Classification of adult underweight, overweight and obesity according to BMI

Classification	**BMI(kg/m^2)**	
	Principal cut-off points	**Additional cut-off points**
Underweight	**<18.50**	**<18.50**
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
Normal range	**18.50 - 24.99**	**18.50 - 22.99**
		23.00 - 24.99
Overweight	**≥25.00**	**≥25.00**
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
Obese	**≥30.00**	**≥30.00**
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	≥40.00	≥40.00

Population in Need:
All adults with BMI below 16 Kg/m2 or adolescents with BMI per age below -3SD (using the WHO references)
Source: WHO Global Database on BMI. http://apps.who.int/bmi/index.jsp, http://www.who.int/growthref/en/index.html

Possible Delivery Channels:
Where the individuals with severe thinness are found in emergency situations, the delivery channels would be those available in the camp.

	% of cases receiving treatment
Community Level	0%
Outreach	15%
Clinic	70%
Hospital	15%

Drugs and Supplies required Per adult:
Adults with severe thinness should be given the same therapeutic feeding as children with SAM, i.e. formula feeds or RUTF (with added mineral and vitamins). Below is a table with the dietary requirements for treatment of SAM for different age groups.

Age (years)	Daily energy requirement		Volume of diet required (ml/kg per hour)	
	(kcal/kg)	(kJ/kg)	F-75	F-100
7-10	75	315	4.2	3.0
11-14	60	250	3.5	2.5
15-18	50	210	2.8	2.0
19-75	40	170	2.2	1.7
>75	35	150	2.0	1.5

Therapeutic foods are estimated based on bodyweight. The OneHealth Tool intervention details assume a body weight of 40 kg, which is when the BMI of an adult of 1.58 m reaches 16.[10]

In the absence of detailed treatment guidelines for adults, a default mixture of hospital and community based treatment using therapeutic foods (F75 /F100/ RUTF[11]) as for treatment of SAM in children is given below:

The OneHealth Tool intervention details assume that 20% of the SAM cases will need hospital-treatment where half of them can continue the full treatment in hospital and another half in the community. It further assumes that 80% do not need treatment in hospital and where community based programmes exist, this group can be treated in the community with RUTF.

An adult 19-75 years of 40 kg would need

- Stabilization in hospital (20% of all cases): approximately 2100 ml F75/day (2.2 ml F75*40 kg*24hours) for a stabilization period of 7 days, equals 25 sachets of F75 (new packaging, 1 sachet to prepare 600 ml) = 11.89 USD
- Rehabilitation in hospital (10% of all cases): adult 19-75 y of 40 kg would need approx 1600 ml F100/day (1.7 ml F100*40 kg*24hours) for a rehabilitation period of 14 days, equals almost 10 sachets of F100 (1 sachet to prepare 2400 ml) = 6.09 USD
- Rehabilitation in community (10% after stabilisation in hospital plus 80% without medical complications): For outpatient care for a rehabilitation period of 8 weeks on RUTF - assume 5 sachets per day for 8 weeks. This would not cover the energy needs, but a higher consumption of RUTF is less realistic. Cost for 8 weeks, 5 sachets daily = 100.80 USD
- Total average cost per case = 20%*11.89 USD + 10%*6.09USD + 90%*100.80USD= 93.71 USD

No separate cost estimates are made for therapeutic feeding of adolescents with severe thinness (BMI/age <3SD in the WHO growth reference for older children and adolescents 5-19 years), who would require a similar treatment scheme. It should be noted that dietary requirements per kg bodyweight in the treatment of SAM in adolescents (15-18 years) are higher than in adults according to table above. This means that, on the one hand, the F75 and F100 consumption would be higher (but RUTF would stay the same as it would be unrealistic that anyone could consume more than 5 sachets per day), whereas on the other hand, adolescent body weight is generally smaller than in adults, thus total treatment might be similar.

Medical drugs required in the treatment are not calculated here. For children under five, medical drugs and supplies required are estimated to about 20 USD/child – but adults and adolescents require different drugs and dosages.

Other programme costs

Other supplies and equipment

Soap distributed to all beneficiaries
Medical supplies (syringes etc), Height boards, scales, MUAC tapes, OTP cards, ration cards, soap, stationary, equipment for preparing F-75 and F-100.

Personnel

Personnel time for management of severe thinness is higher in hospital than in community. Time should also be allowed for counselling.

Training

[10] This assumption may cause an underestimation of cost if the severely undernourished adult population is on average taller than 1.58 cm, but on the other hand many individuals are admitted when BMI is even lower than 16 and would have a lower body weight than 40kg.

[11] CSB+ or other supplementary foods should not be used in SAM treatment, however they may be important in certain settings and conditions (e.g. emergencies, HIV, etc) for treating MAM and thus preventing development of SAM.

Hospital-based management of SAM (6 days)
On-site supervision: 2 to 3 days

Admission
For hospital based management, costs of admission and uptake of hospital beds

Logistics
Therapeutic foods are bulky to transport, so this need to be taken into account under programme costs

Personnel Time Required per Case:
Hospitalized cases: Nurse 1 hour per day, Medical doctor: 30-60 min per case per day during stabilisation, Assistant: 1 hour per day (Sphere handbook recommends 1 assistant per 10 children)

Clinic community level: Follow-up every 1-2 weeks, 10 minutes by nurse or CHW over 2 months

Hospitalization:
Adults with severe thinness undergoing inpatient treatment require hospitalization as indicated above.

All populations

Intervention 122: Wheat and maize flour fortification with iron and folic acid for preventing anaemia and folate-preventable congenital anomalies

Definition:
WHO recommends the individual or combined addition of iron, vitamin A, folic acid, zinc and vitamin B12 to wheat and maize flours. Technical issues such as appropriate nutrient levels to add, its interactions with the food and other nutrients, the type of flour or the consumer acceptability are important to consider prior to the initiation of a fortification programme (http://www.who.int/elena/titles/flour_fortification/en/index.html).

Wheat and maize flour fortification is a preventive food-based approach to improve micronutrient status of populations over time that can be integrated with other interventions in the efforts to reduce vitamin and mineral deficiencies when identified as public health problems. However, fortification of other appropriate food vehicles with the same and/or other nutrients should also be considered when feasible. Wheat and maize flour fortification should be considered when industrially produced flour is regularly consumed by large population groups in a country.

Although many pregnant women have several micronutrient deficiencies, and an estimated 42% of pregnant women worldwide are anaemic with approximately 60% of these cases in non-malarious areas, and 50% in malaria-endemic areas. Most are presumed to be due to iron deficiency (WHO guideline: Use of multiple micronutrient powders for home fortification of foods consumed by pregnant women. 2011). The use of multiple micronutrient powders for home fortification of foods consumed by pregnant women is currently not recommended due to insufficient evidence, but supplementation of multiple micronutrients is recommended to pregnant and lactating women and children living in emergencies.

Population in Need:
Untargeted unless some processed food purposefully target a particular sub-group such as complementary food for young children. The entire population that consumes the fortified food/food ingredient will benefit. Particularly women of reproductive age at risk of NTD pregnancies are expected to benefit (from the folic acid). There is currently an interim consensus statement recommending this approach integrated with other approaches (2009).

Possible Delivery Channels:
It is assumed that the fortification is carried out by private food-producing companies. And so generally distributed through normal food retail mechanisms unless targeted by Governments for poorer and at-risk populations.

Drugs and Supplies required Per Person:
The model does not include these costs as they are not borne by the government. However, in a study in Chile, it was found that for the mill industry, one year of flour fortification cost approximately US$ 280,000; this cost included the addition of folic acid to the existing premix added to flour and conducting analytical testing for folic acid content.

Average levels of nutrients to consider adding to fortified wheat flour based on extraction, fortification compound, and estimated per capita flour availability are shown in the table below, including some other micronutrients occasionally added to flour).

See table below for nutrient content required, but if fortification done by the private sector (as is usual) then the added cost will be zero (to Government although consumer would often pay an increment for the food having been fortified).

Nutrient	Flour Extraction Rate	Compound	Level of nutrient to be added in parts per million (ppm) by estimated average per capita wheat flour availability (g/day)[1]			
			<75[2] g/day	75-149 g/day	150-300 g/day	>300 g/day
Iron	Low	NaFeEDTA	40	40	20	15
		Ferrous Sulfate	60	60	30	20
		Ferrous Fumarate	60	60	30	20
		Electrolytic Iron	NR[3]	NR[3]	60	40
	High	NaFeEDTA	40	40	20	15
Folic Acid	Low or High	Folic Acid	5.0	2.6	1.3	1.0
Vitamin B_{12}	Low or High	Cyanocobalamin	0.04	0.02	0.01	0.008
Vitamin A	Low or High	Vitamin A Palmitate	5.9	3	1.5	1
Zinc[4]	Low	Zinc Oxide	95	55	40	30
	High	Zinc Oxide	100	100	80	70

1. These estimated levels consider only wheat flour as main fortification vehicle in a public health program. If other mass-fortification programs with other food vehicles are implemented effectively, these suggested fortification levels may need to be adjusted downwards as needed.
2. Estimated per capita consumption of <75 g/day does not allow for addition of sufficient level of fortificant to cover micronutrients needs for women of childbearing age. Fortification of additional food vehicles and other interventions should be considered.
3. NR = Not Recommended because very high levels of electrolytic iron needed could negatively affect sensory properties of fortified flour.
4. These amounts of zinc fortification assume 5 mg zinc intake and no additional phytate intake from other dietary sources.

Personnel Time Required per Case:
No cost to the government since no health staff involved (except perhaps in quality control measures and in promoting the use of fortified products as part of nutrition education and counselling).

Children

Intervention 123: Breastfeeding counselling and support

This section does not include the implementation of the BFHI, baby friendly health centres, etc. which are covered under programmes/systems cost.

Definition:
Mothers are counselled to exclusively breastfeed for 6 months after delivery, followed by appropriate complementary feeding and continued breastfeeding for 2 years or beyond. Appropriate breastfeeding includes early initiation, exclusive breastfeeding for the first six months, and continued breastfeeding up to two years or beyond. An existing evidence-based guideline on exclusive breastfeeding is being updated (http://www.who.int/entity/elena/titles/continued_breastfeeding/en/index.html, http://www.who.int/entity/elena/titles/early_breastfeeding/en/index.html, http://www.who.int/entity/elena/titles/exclusive_breastfeeding/en/index.html).

Costs were included for 6 counselling sessions:
two antenatal care sessions, one session immediately after birth, one session within the first week after birth; one session at 6 weeks; and one session between 5 and 6 months of life.

The recommendation for infant and young child feeding sessions is the following:

- Pregnancy: First pregnancy visit: as early as possible; second pregnancy visit: about 2 month before delivery (as part of one of four ANC visits)
- Neonatal period: First postnatal visit: on Day 1; second postnatal visit: on Day 3; third postnatal visit: on Day 7
- For small and low birthweight babies: make additional visits on Day 2 and 14
- For infant 1 month - 23 months:
    - Recommended: Visit 1: 1 - 2 months; visit 2: 3 - 4 months; visit 3: 5 - 6 months;
    - Opportunistic contacts in community or in clinic for the child at 6 - 8 months, child 9 - 11 months, and at least once during the next12 - 23 months

Population in Need:
All mothers with infants and young children (0-24 months old)

Delivery channels:
This intervention is provided during ANC, delivery and during the postpartum visit. Whatever the user entered for the delivery channels for those interventions will be used to estimate the delivery channel mix for this intervention.

	% of cases receiving treatment
Community Level	40%
Outreach	10%
Clinic	50%
Hospital	0%

Drugs and Supplies required Per Woman:
Exclusive and prolonged breastfeeding require no drugs or supplies (for some mothers multimicronutrient or iron/folic acid tablets may be needed according to conditions e.g. emergencies). In 1-5% of breastfeeding mothers, cloxacillin will be required for the treatment of mastitis.

Cost per woman per pregnancy = $0.00

Personnel Time Required per Case:
6 counselling sessions: 10 minutes each during ANC, and at weeks 1 and 6, and at month 5 with 20 minutes immediately after birth giving a total of 70 minutes of counselling. This is usually provided by the nurse/midwife, but also possible by peer counsellor or CHW.

Other Costs:

Training:
- Integrated IYCF counselling 5-day course for health workers
- 3 days BFHI (for early initiation and EBF), 5 days on BFC (for all BF), 5 days on IYCFC (all BF, HIV and IF, CF), IMCI (hours for BF and CF) for hospital staff

Materials: Counseling tools (flip charts, etc.), other material and training on counseling skills should be taken into account in programme costing sections of OneHealth Tool.

Personnel time: required for counseling sessions should be taken into account in human resources sections of One Health Tool.

Intervention 124: Complementary feeding counselling and support

Definition:
Comprehensive counselling for the caregiver of a child (two full sessions) on the importance of continued breastfeeding after six months of age along with information on appropriate complementary feeding practices (http://www.who.int/entity/elena/titles/complementary_feeding/en/index.html).

Population in Need:
All children between 6 and 23 months of age.

The recommendation for infant and young child feeding sessions to the mother or caregiver is the following:
- For an infant 6 months - 23 months:
    - Recommended: at 5 - 6 months;

- Opportunistic contacts in community or in clinic for the caregiver with a child at child 6 - 8 months, 9 - 11 months, and at 12 - 23 months.

Delivery Level:
This could be either at the community level through CHWs or during visits of the child to the health system.

	% of cases receiving treatment
Community Level	50%
Outreach	0%
Clinic	50%
Hospital	0%

Drugs and Supplies required Per Child:

Cost per child = $0.00

Depending on the condition of the child, or special circumstances in which the child is living, additional measures may be required.

Personnel Time Required per Child:
10 minutes x 3 visits

Programme Costs:

Training: integrated IYCF counselling (5 days)

Materials: Counseling tools (flip charts, etc.), other material and training on counseling skills should be taken into account in programme costing sections of One Health Tool.

Personnel time: required for counseling sessions should be taken into account in human resources sections of One Health Tool.

For reference, others have estimated costing of behavior change interventions in nutrition:
From REACH costing tool:
$0.89 for education and behavior change materials. Assumes development and provision of IEC materials for behaviour change (Cost and Effectiveness. LINKAGES Madagascar." Abt Associates, 2004).

$4.05 for delivery at community level. Assumes training for community members and program staff, M&E, policy advocacy (Cost and Effectiveness. LINKAGES Madagascar." Abt Associates, 2004).

$7.50 (WB) (Horton, Shekar, McDonald, Mahal, Brooks). Scaling Up Nutrition. What will it cost? 2010)

$0.26 for mass media. Assumes countrywide radio and TV ads (Estimate based on Ghana hand washing campaign ($ 920 K spent for radio and TV over 3 years to reach 2.5 M women and 3.5 M children. "Ghana washes her hands. Business plan" CWSA, 2002).

Intervention 125: Multiple micronutrient powders for home fortification of foods consumed by infants and young children 6-23 months of age

Definition:
Multiple micronutrient powders are powders of various vitamins and minerals (WHO recommends that they contain at least iron, vitamin A and zinc) added to/sprinkled on the child's complementary foods. There is a strong recommendation for their use in improving iron status and reducing anaemia (WHO guideline: use of multiple micronutrient powders for home fortification of foods consumed by infants and children 6-23 months of age. 2011, http://www.who.int/elena/titles/micronutrientpowder_infants/en/index.html). Multiple micronutrient powders can be used for this age group in malaria-endemic areas but in conjunction with measures to prevent, diagnose and treat

malaria. The guideline is not applicable to children with specific conditions such as human immunodeficiency virus (HIV) infection or tuberculosis as the effects and safety of the intervention in these specific groups have not been evaluated.

Population in Need:
It is estimated that 190 million preschool infants and children are affected by vitamin A deficiency and 293 million are anaemic. Nutritional risk factors, including underweight, suboptimal breastfeeding, and vitamin and mineral deficiencies, particularly vitamin A, iron or zinc deficiency, are responsible for 3.9 million deaths (35% of total deaths) and 144 million disability-adjusted life years (DALYs)(33% of total DALYs) in children less than 5 years of age (WHO, Global health risk. Mortality and burden of disease attributable to selected major risks.).

WHO recommends this intervention to all infants and children 6-23 months in settings where the prevalence of anaemia in children under 2 years, or under 5 years is 20% or higher (WHO 2011).

Delivery Level:
This intervention is to be used in the home (or in-patient in some cases) and so be delivered at the community level (including in some trials through the private sector with the added cost of social marketing), clinics and rarely hospitals. They have also been extensively used in emergency situations.

	% of cases receiving treatment
Community Level	50%
Outreach	10%
Clinic	35%
Hospital	5%

Drugs and Supplies required Per Child:
1 sachet per day for, at a minimum a period of 2 months, followed by a period of 3-4 months of supplementation, so that the use of the micronutrient powders is started every six months for 2 months of supplements for those children who need it

1 sachet MNP daily for 2 x 2 months/year. Using S0000225 Multiple micrn. pdr,custom sach./PAC-30 at USD 0.52, cost per child per year = USD 2.08

Programmes involving the use of multiple micronutrient powders for home fortification of foods should be preceded by an evaluation of the nutritional status among children under 5 years of age and existing measures to control anaemia and vitamin A deficiency, such as hookworm control programmes, the provision of supplements and the use of other products for home fortification of foods and fortified complementary foods, to ensure that the daily micronutrient needs are met and not exceeded.

Personnel Time Required per Case:
15 minutes x 2 visits. The WHO recommendation includes a remark that before starting there should be an evaluation of the child's nutritional status and existing measures – this would require at least 15 minutes consultation.

Training: Intensive counselling for the caregiver of a child (two full sessions) on the importance of continued breastfeeding after six months of age along with information on appropriate complementary feeding practices.

Other costs:
MNP programmes should also include a behaviour change communication strategy that promotes: awareness and correct use of the powders along with information on recommended breastfeeding practices; commencement of complementary foods at 6 months of age; preparation of complementary foods at age-appropriate frequency, amounts, consistency and variety; hand washing with soap and hygienic preparation of food; prompt attention to fever in malaria settings; and measures to manage diarrhoea.

Intervention 126: Counselling and support for appropriate feeding of low-birth-weight (LBW) infants

Definition:
LBW is defined as weight at birth <2500g. The global prevalence is 15.5% or about 20 million per year, 96.5% of them in developing income countries (WHO. Guidelines on Optimal feeding of low birth-weight infants in low-and middle-income countries, 2011). The most common cause is poor intra-uterine growth (small for gestational age or SGA) but pre-term births are usually included in the incidence in poor- and middle-income countries. Pre-term birth is a direct

cause of 27% of the 4 million neonatal deaths every year, and directly or indirectly, LBW may contribute to 60-80% of all neonatal deaths. LBW infants are also at higher risk of early growth retardation and stunting, susceptibility to infectious diseases, developmental delay and death during infancy and childhood (WHO 2011, http://www.who.int/elena/titles/supplementary_feeding/en/index.html, http://www.who.int/elena/titles/demandfeeding_infants/en/index.html, http://www.who.int/elena/titles/donormilk_infants/en/index.html).

Population in Need:
All infants born with a birth weight <2500g.

Delivery Channels:
Depending on local and national circumstances 50% in hospitals, 40% in clinics and 10% in the community (home births).

Drugs and Supplies required Per Child:
LBW infants, including those with very low birth weight (VLBW) should be fed mother's own milk. For LBW infants, including those with VLBW, who cannot be fed mother's own milk, it is recommended to feed donor human milk as a second option to breastmilk and standard infant formula as the last option.

VLBW infants who are fed mother's own milk or donor human milk should receive iron supplementation.
VLBW infants who cannot be fed mother's own milk or donor human milk should be given preterm infant formula if they fail to gain weight despite adequate feeding with standard infant formula.

The costs associated with this intervention will be those relating to iron supplementation to VLBW infants fed mother's own milk or donor human milk, costs of donor human milk from a milk bank, or any standard of preterm infant formula.

As mother's own milk is the first choice, no default cost has been entered for this intervention. However, there will be costs associated with personnel time for counseling and support to mothers to care for their LBW, but these costs are accounted for in the programme and human resources module. Programme support costs include counseling material and human milk banks. There will also be costs for infant formula to those few LBW and VLBW who cannot be fed human milk as described above.

Personnel time:
Will depend on how long the infant and mother remain in hospital (or clinic) but will be absorbed by Hospital running costs but will be large costs depending on degree of prematurity and hospital capacity. At a minimum, at least 3 follow-up visits of 15 minutes each after discharge.

Programme costs:

Materials: Counseling tools (flip charts, etc.), other material, and training on counseling skills should be taken into account in programme costing sections of the One Health Tool.

Personnel time: required time for counseling sessions should be taken into account in the human resources sections of the One Health Tool.

Training:
WHO-NHD: Integrated IYCF counselling course, 5-day course for health workers
WHO-MCA: Caring for the newborn at home. A training course for community health workers

Human milk bank
The cost of setting-up and running human milk banks has been explored recently by PAHO and include
- Physical space, equipment (refrigerator, lab, freezer, testers, sterilization, computers for tracking,
- At least 3 personnel (microbiologist, nurse, administrator)

Intervention 127: Vitamin A supplementation in infants and children 6-59 months of age

Definition:
Vitamin A supplementation for all children 6-59 months of age in countries (or sub-national areas in some cases) where vitamin A deficiency is a public health problem is strongly recommended by WHO (WHO guideline: Vitamin A supplementation in infants and children 6-59 months of age . 2011, http://www.who.int/entity/elena/titles/vitamina_children/en/index.html). Vitamin A supplementation is mainly used to improve child survival in areas with a high under five child mortality rates (as a vitamin A-deficient child is approximately 23% more likely to die of infectious disease). Vitamin A supplements are also used therapeutically in children presenting with acute signs of xerophthalmia, such as night blindness, which has an increased risk of death or blindness as well as for the treatment of measles.

Population in Need:
Children 6-59 months of age living in areas where there is a public health problem of vitamin A deficiency (WHO guideline. Vitamin A supplementation in infants and children 6-59 months of age. 2011). This is defined as populations where the prevalence of night blindness is ≥1% in children 24-59 months of age or where the prevalence of vitamin A deficiency (serum retinol ≤ 0.70 µmol/l) is 20% or higher in infants and children 6-59 months of age (WHO 2011). This includes infants and children living with HIV.

Currently neonatal vitamin A supplementation and vitamin A supplementation for infants 1-5 months of age is not recommended by WHO (WHO guideline: Neonatal vitamin A supplementation. 2011 and WHO guideline. Vitamin A supplementation in infants 1-5 months of age. 2011).

Possible Delivery Channels:
Vitamin A supplements are most frequently distributed through national campaigns (previously often stand-alone but increasingly as Child Health Day-type campaigns when the child may also receive immunizations, deworming etc.). In some countries' urban areas, supplements are more often given through the health facility. They can also be distributed through clinics for therapeutic needs.
(assumptions used in CHCET tool probably need to be changed but are currently 100% through Health Facilities in urban children; 80% by a CHW in rural areas with other 20% at the facility level.)

Drugs and Supplies required Per Child:

100,000 IU (30mg RE (retinol equivalents)) capsule (or liquid) of retinyl palmitate once during the period 5-11 months; 200,000 IU (60mg RE) every 4-6 months from 12 – 59 months.

1 x vitamin A (100,000 IU) for infants 6-11 months (one dose) per first year and 2 x vitamin A (200,000 IU) for children 12-59 months per year. Using S1583015 Retinol 100,000IU soft gel.cps/PaC-500 at USD 7.92 and S1583000 Retinol 200,000IU soft gel.caps/PaC-500 at USD 10.13, cost per infants 6-11 months per year = 0.02 USD, and cost per child 12-59 months per year = 0.08 USD.

Personnel time
For the national campaigns, costs are often shared, or carried by EPI but with second dose by vitamin A programme or through Child Health Day activities. Different countries pick up different proportions of costs according to Department management. If delivered through a facility or for treatment CHCET assumed that this intervention will be delivered while the child is seeing the health or community health personnel for some other intervention, and thus 2 minutes of nurse's time by 3 visits but as noted this is still an uncommon way for a child to receive the vitamin A capsule.

Intervention 128: Vitamin A supplementation for treatment of xerophthalmia

Definition:
Therapeutic doses of vitamin A for the treatment of xerophthalmia, including night blindness, Bitot's spots, corneal xerosis, corneal ulceration, and keratomalacia.

Population in Need:
All individuals presenting with signs of active xerophthalmia, including night blindness, Bitot's spots, corenal xerosis, corneal ulceration, and keratomalacia.

Possible Delivery Channels:
100% clinic

Drugs and Supplies required:

Women of reproductive age
In most cases, women of reproductive age presenting with night blindness or Bitot's spots should receive daily oral doses (5,000-10,000 IU) or a weekly dose (25,000 IU or less) of vitamin A for at least 4 weeks (WHO WHO, UNICEF, IVACG Task Force. Vitamin A supplements: a guide to their use in the treatment and prevention of vitamin A deficiency and xerophthalmia, 2nd ed. Geneva, World Health Organization, 1997).

The default used in the OneHealth Tool is 1 tablet 10,000 IU vitamin A daily for 4 weeks. Using MSH International drug price calculator unitary cost of 10,000 IU vitamin A at 0.0114 USD/pill, cost per woman treated (4 weeks, 7 days/week) = USD 0.32

Alternatively, if weekly doses of vitamin A are used in the country, using MSH International drug price calculator unitary cost of 25,000 IU vitamin A at a median price of 0.0758 USD/pill, cost per woman treated (4 weeks) = USD 0.30

Personnel time
20 minutes of a nurse's time (10 minutes for initial visit, 2X5 minutes follow-up).

Other costs
Individuals with acute corneal lesions should be referred to a hospital on emergency basis (upon diagnosis of xerophthalmia and giving the first dose of vitamin A) as they present complex treatment problems.

Intervention 129: Intermittent iron supplementation in preschool and school-age children

Definition:
Globally it is estimated there are 600 million preschool and school-age children anaemic, and about half of these are due to iron deficiency. This has been linked to increased child morbidity and impaired cognitive development and school performance – and if these impairments occur at an early age may be irreversible (WHO Guideline: Intermittent iron supplementation in preschool and school-aged children 2011, http://www.who.int/entity/elena/titles/iron_infants/en/index.html). This is a strong recommendation.

Population in need:
Pre-school children 24-59 months and school-aged 5-12years, where the prevalence of anaemia in preschool or school-aged children is 20% or higher.

Possible delivery channels:
Where feasible throughout school or calendar year. 100% community.

Drugs and supplies required per child:
For preschool children 25mg of elemental iron as drops or syrup; for school-aged 45mg of elemental iron as tablets or capsules, both for 3 months of supplementation followed by 3 months of no supplementation after which the provision of supplements should restart.

Preschool children:
25 mg Iron syrup weekly for 2x3 months per year. Using MSH international drug price indicator unitary price at 0.0068 USD/ml for iron syrup with strength of 20 mg iron/ml, cost child per year = USD 0.20 USD.

School children:
60 mg Iron weekly for 2x3 months per year. Using UNICEF S1550000 Ferrous salt 60mg iron tabs/PAC-1000 at USD 3.11, cost child per year = USD 0.07 USD.

Personnel time:
5 minutes of nurse's time in a clinic or school (if given by teachers in some settings time would be covered already).

Intervention 130: Daily iron supplementation in children 6 to 23 months old if anaemia prevalence is more than 40%

Definition:
Iron deficiency, as well as iron deficiency anaemia, can affect the growth and development of infants and young children, as well as the health of their immune systems. These developmental impacts can occur in utero, and if prolonged for the first couple of years of life are likely to be irreversible, emphasizing the need for good maternal nutrition. In this intervention, where the diet does not include fortified foods, or prevalence of anaemia in children approximately 1 year of age is severe (above 40%)12, supplements of iron at a dosage of 2 mg/kg of body weight/day should be given to all children between 6 and 23 months of age (WHO 2001, Iron deficiency anaemia: assessment, prevention and control).

Population in Need:
Children 6-23 months old where the diet does not include foods fortified with iron or where anaemia prevalence is above 40%.

Delivery Channels:

[12] For this age group, when anaemia is above 20%, MNPs are recommended

Can be addressed by iron liquid supplementation through clinics or now more commonly and probably more effectively through the use of multiple micronutrient powders.

Drugs and Supplies required Per Child:
The recommendation is 2 mg elemental iron/kg/day for 3 months. A child weight estimate of 12 kg is used, approximately the median weight of boys 6-23 months according to WHO Growth Standards. Using MSH international drug price indicator unitary price at 0.0068 USD/ml for iron syrup with strength of 20 mg iron/ml, cost per child per episode = USD 0.73 USD*

* 3 months x 30 days/months x 2mg iron/(kg*day) x 12 kg/child x USD 0.068/(ml*20 mg iron) = USD 0.73 USD/(child*day)

Personnel time:
If curative, then 5 minutes of a nurse's time over 4 visits, although there should be further time spent on examining the health, wealth and dietary practices of the household and community.

Intervention 131: Iodine supplementation in young children

Definition:
Universal salt iodization (USI) remains the prime intervention as it is safe, cost-effective and sustainable (WHO/UNICEF. Joint statement on reaching optimal iodine nutrition in pregnant and lactating women and young children. 2007, http://www.who.int/entity/elena/titles/iodine_pregnancy/en/index.html). However, the most susceptible groups – pregnant and lactating women and children <2 years of age may not be adequately covered by iodized salt where USI is not fully implemented and therefore need supplementation.

Population in Need:
All women of reproductive age and children between 6 and 23 months of age should have access to adequately iodized salt. In countries, or areas within countries, in which 20-50% of the households have access to iodized salt, or <20%, then these countries need to assess their USI strategy and programme. If it does not succeed in scaling-up after 2 years, then supplementation needs to be considered, and especially in the <20% USI group of countries, supplementation needs to be implemented (WHO/UNICEF 2007). Coverage of salt iodization in countries can be found at NLIS country profiles (www.who.int/nutrition/nlis) which draws data from UNICEF ChildInfo (www.childinfo.org/idd_profiles.php).

Delivery Level:
USI is delivered through the private sector (although some countries have targeted supplies of iodized salt for vulnerable groups such as the lowest socio-economic groups). Where supplementation is required, it will be 100% though clinics.

Drugs and Supplies required

Population group	Daily iodine supplement dose (µg/d)	If given a single annual dose (mg/y)
Pregnant women	250	400
Lactating women	250	400
WRA (15-49y)	150	400
Children (<2 y)	90	200

Children, annual supplementation
1 tablet 200mg iodized oil capsules per year. Using UNICEF S0000200 Iodized oil 200mg caps/PAC-1500 at USD 345.69, cost per child per year = USD 0.23

Personnel Time required per mother and child:
5 minutes to distribute supplements
Promotion of the use of iodized salt

Intervention 132: Management of children with severe acute malnutrition

Definition:

The integrated management of children with Severe Acute Malnutrition (SAM) includes outpatient care for cases without medical complication, and inpatient care for cases with medical complications or infants younger than 6 months.

Severe acute malnutrition is defined as severe wasting by a very low weight for height (below -3SD of the median WHO growth standards), or by a very low mid-upper arm circumference (<11.5 cm), or by the presence of bilateral pitting nutritional oedema. See also the identification of children with SAM (www.who.int/nutrition/publications/severemalnutrition/9789241598163/en/index.html; community-based management of SAM (www.who.int/nutrition/publications/severemalnutrition/9789280641479/en/index.html; micronutrient supplementation in SAM (www.who.int/elena/titles/micronutrients_sam/en/index.html); as well as links in the management of dehydration, hypoglycaemia, and hypothermia associated with SAM (http://www.who.int/elena/titles/dehydration_sam/en/index.html; http://www.who.int/elena/titles/hypoglycaemia_sam/en/index.html; http://www.who.int/elena/titles/hypothermia_sam/en/index.html; http://www.who.int/elena/titles/hiv_sam/en/index.html).

Inpatient care
Infants with SAM below 6 months of age and older infants and children with SAM and medical complications are managed at the hospital (inpatient care) until they are stable. Management in the hospital includes prevention and treatment of hypothermia, hypoglycaemia , treatment of dehydration, septic shock, severe anaemia, the treatment of infections, dietary treatment using special formulas (F75 until regain of appetite and reduced oedema followed by either RUTF or F100) that include micronutrients specific to the needs of children with SAM.

Outpatient care
Infants above 6 months of age and older infants and children with SAM but with no medical complications can be treated through outpatient care and should receive rations of ready-to-use therapeutic food (RUTF) until they have gained adequate weight. Children receiving outpatient care are those who are in stable condition (with no medical complications and who have appetite), and are either in outpatient care or discharged from the Hospital (in-patient care)
In addition to the provision of RUTF, children need to receive a short course of basic oral medication to prevent and treat infections.
Follow-up, including the provision of the next supply of RUTF, should be done weekly or every two weeks by a skilled health worker in a nearby clinic or in the community.

RUTF can be purchased internationally or produced locally, see http://www.who.int/child-adolescent-health/New_Publications/NUTRITION/CBSM/tbp_4.pdf

Population in Need:
100% of infants and children 0-59 months old with SAM.

The OneHealth Tools assumes that approximately 80% of children with SAM will have no complications and can be managed as outpatients through primary health facilities and outreach services, where such programmes exist.

The remaining 20% of children with SAM will have complications, or will be infants less than 6 months with SAM, and both need to be stabilised at the hospital level, after which those older than 6 months usually can be rehabilitated in the community where such programmes exist. Whereas the supply costs of RUTF are higher than formulas in hospital, there is an added value for the infants above 6 months and children to be treated at home, including reducing the risk of cross-infections which can be a problem in the hospital environment and the mother's time outside of the household.

The One Health Tool thus assumes:
- 20% children in need of hospital-based stabilization, of which
  - 10% are rehabilitated in hospital and
  - 10% are rehabilitated at home
- 80% children without need for hospital-based management

These figures are arbitrary as treatment pathways will depend on existing delivery systems in the countries.

Possible Delivery Channels:
Outpatient care through community health workers and primary health facilities (80% of cases)
Inpatient care through inpatient health facilities (10% of cases) and mixed inpatient and community-based care (10%)

Drugs and Supplies required Per Child:

1) ***With medical complications or younger than 6 months***

Stabilization

- Cost of commonly needed medical treatment based on forthcoming WHO recommendation for drug kit needed for inpatient treatment of children with SAM, details included in software, on average 17.59 USD per case .
- or inpatient care, a child (average weight of 7 kg) would need 700ml/day for a stabilization period of 7 days, equals 8,17 sachets of F75 (1 sachet to prepare 600 ml). 3.94041667 Using UNICEF S0000208 F-75 Therapeutic milk, 120 sachets/pouches of 102.5 g per carton at 57.90 USD, the cost of the stabilization period is 3.94 USD

Rehabilitation in the hospital[13]

- For a transition and rehabilitation period of 14 days using F-100, a child (average weight of 7 kg) would need 1400 ml/day of F100 (1 sachet to prepare 2400 ml). Using UNICEF S0000209 F-100 therapeutic diet,sach.,114g/CAR-90 at 75.60 USD, the cost of the rehabilitation period is 5.23 USD.

Rehabilitation in the community[14]

- RUTF is provided according to the weight of the child on a weekly basis at approximately 200kcal/kg of body weight. For a child of 7 kg, an episode of SAM requires approximately 20 sachets RUTF per week for 8 weeks. Using UNICEF S0000240 Therapeutic spread, sachet 92g/CAR-150 at 54.00 USD, this equals 57.60 USD for the rehabilitation period in the community.

2) Without complications and older than 6 months - Community and Clinic Level

RUTF is provided according to the weight of the child on a weekly basis at approximately 200kcal/kg of body weight. For a child of 7 kg, an episode of SAM requires approximately 20 sachets RUTF per week for 8 weeks. Using UNICEF S0000240 Therapeutic spread, sachet 92g/CAR-150 at 54.00 USD, this equals **57.60 USD** per episode for **child of 7 kg** with SAM for community-based management.

For the basic oral medication to prevent and treat infections, OHT assumes:

- Antibiotics to all children receiving outpatient treatment, 3 times a day for 7 days. Using S1505060 Amoxicillin250mg tabs/PAC-1000 at 15.95 USD, the average cost per case will be 0.17 USD
- Deworming to all children receiving outpatient treatment, 1 pill per child. Using S1555360 Mebendazole500mg chewable tabs/PAC-100 at 2.25 USD, average cost per case will be 0.02 USD

Therapeutic foods are estimated based on bodyweight. Traditionally a bodyweight of 7 kg is used for estimating costs of treating children with SAM, however it should be noted that this may cause an underestimation of cost as according to the WHO Child Growth Standards, a boy of 5 years and 12 kg is below -3SD and so will be defined as SAM and require proportionally higher quantities of therapeutic feeding than the average child of 7 kg. Countries need to take into consideration what age groups usually most at risk and are treated, and at how severely malnourished they are when they usually are taken for treatment (many children are only admitted when closer to -4SD). The estimated cost for a child at 12kg is also given in the footnote[15], for countries to see the possible range of cost per child.

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[13] Guidelines are not established for the appropriate rehabilitation of infants 0-6 months. Ideally the aim should be to reestablish effective exclusive breastfeeding from mother or wetnurse, if possible. Alternative supplementary or replacement feeding include infant formula, F75, or F100-Diluted (should not be given to infants with oedema). Note that RUTF or F100 are not appropriate for this age group..

[14] Same as previous footnote.

[15] Estimated costs for treatment of child of 12 kg

1) ***With medical complications or younger than 6 months***

Stabilization

- Cost of commonly needed medical treatment based on forthcoming WHO recommendation for drug kit needed for inpatient treatment of children with SAM, details included in software, on average 17.59 USD per case
- Total supplies cost for F75 in hospital based management of **child of 12 kg** with SAM (who needs proportionally more therapeutic food) = 6.76 USD)

*Rehabilitation in the hospital**

- Total supplies cost for F100 in hospital based management of **child of 12 kg** with SAM (who needs proportionally more therapeutic food) = 8.96 USD

*Rehabilitation in the community**

- Total supplies cost RUTF in community for management of **child of 12 kg** with SAM (who needs proportionally more therapeutic food) = 98.74 USD

2) Without complications and older than 6 months - Community and Clinic Level

Total supplies cost RUTF in community for management of **child of 12 kg** with SAM (who needs proportionally more therapeutic food) = 98.74 USD.

For the basic oral medication to prevent and treat infections, OHT assumes:

- Antibiotics to all children receiving outpatient treatment, 3 times a day for 7 days. Using S1505060 Amoxicillin250mg tabs/PAC-1000 at 15.95 USD, the average cost per case will be 0.17 USD
- Deworming to all children receiving outpatient treatment, 1 pill per child. Using S1555360 Mebendazole500mg chewable tabs/PAC-100 at 2.25 USD, average cost per case will be 0.02 USD

*Guidelines are not established for the appropriate rehabilitation of infants 0-6 months. Ideally the aim should be to reestablish effective exclusive breastfeeding from mother or wetnurse, if possible. Alternative supplementary or replacement feeding include infant formula, F75, or F100-Diluted (should not be given to infants with oedema). Note that RUTF or F100 are not appropriate for this age group

Other programme costs

Other supplies and equipment
Soap distributed to all beneficiaries
Medical supplies (syringes etc), height boards, length boards, scales, MUAC tapes, OTP cards, ration cards, soap, stationary, equipment for preparing F-75 and F-100.

Training
Hospital-based management of SAM (6 days)
On-site supervision: 2 to 3 days

Admission
For hospital based management, costs of admission and uptake of hospital beds

Logistics
Therapeutic foods are bulky to transport, so this need to be taken into account under programme costs

The total costs of management of SAM have recently been estimated in the World Bank Scaling Up exercise, which describes it the most resource-intense nutrition SUN intervention at $200 per episode per child or $2.6 billion needed globally a year. (WB. (Horton, Shekar, McDonald, Mahal, Brooks). Scaling Up Nutrition. What will it cost? 2010). That is cost per episode but depending on local circumstances there may well be one or more episodes per year before 5 years of age, and especially before 2 years of age, particularly in civil strife or emergency situations. Horton et al estimated the default cost at $200 per episode

Personnel Time Required per Case:
Personnel time for management of SAM is higher in hospital than in community. Time should also be allowed to counsel mothers and families.

Hospitalized treatment: Nurse 1 hour per day, Medical doctor: 30-60 min per case per day during stabilisation, Assistant: 1 hour per day (Sphere handbook recommends 1 assistant per 10 children)

Clinic community level: Follow-up every 1-2 weeks, 10 minutes by nurse or CHW over 2 months

Hospitalization:
Children with SAM 6-59 months and medical complications needs on average 7 to 10 days hospitalisation before being referred to outpatient care for rehabilitation.
If referral to outpatient care is not possible, an estimated duration of 3 weeks will be necessary for the child to meet the discharge criteria.

Intervention 133: Management of children with moderate acute malnutrition

Definition:

It is estimated that moderate acute malnutrition (-3SD≤weight for height < -2SD) affects around 40 million children. Moderate wasting contributes to increased morbidity and mortality, impaired intellectual development, suboptimal adult work capacity and even increased risk of disease in adulthood. The dietary management of moderate acute malnutrition in children should normally be based on the optimal use of locally available nutrient-dense foods. In situations of food shortage, or where some nutrients are not sufficiently available through local foods, specially formulated supplementary foods are usually required to supplement the regular diet.

The management of acutely moderately malnourished children is important because it is far more common than severe acute malnutrition in most settings and affects enormous numbers of children globally . All children with moderate wasting have in common a higher risk of dying and a need for special nutritional support (Briend & Weise Prinzo. Dietary management of moderate malnutrition: time for a change. Food Nutr Bull 2009;30:S265-6).

Care of children with moderate acute malnutrition should be based on dietary management of existing diets by nutritional counselling and, if needed, by the provision of appropriate food supplements providing nutrients that cannot be easily provided by local foods.

Currently there are no evidence-informed recommendations for the composition of supplementary foods that are especially designed for the management of children with moderate acute malnutrition, but WHO has issued a Technical Note on "Supplementary foods for the management of moderate acute malnutrition in infants and children 6–59 months of age" (www.who.int/nutrition/publications/moderate_malnutrition/en/index.html).

Population in Need:

Children 6-59 months old with MAM (-3SD≤weight for height <-2SD or 11.5cm≤MUAC< 12.5cm) and no bilateral pitting oedema)

Possible Delivery Channels:

50% clinics and 50% community by default depending on the local circumstances and capacities. These should be adjusted according to local information of how either counselling, food supplementation or both are customarily delivered to the recipients or their families (www.who.int/elena/titles/food_children_mam/en/index.html).

Drugs and Supplies required Per Child:

The most common supplement used in supplementary feeding schemes are CSB++ (corn-soy blend with additional nutrients added) and LNS (lipid-based nutritional supplements). The OneHealth Tools assumes a 50-50% distribution between the treatment options, which has to be adjusted in each country depending on existing programmes.

The estimation for supplementary feeding in treatment of MAM is based on 91 days, which is the upper range of median of monthly average duration of stay in the programme (48 - 91 days) (ref: www.odi.org.uk/resources/docs/3367.pdf).

The cost of medical treatment of disease, infections, etc. is not included here, because in contrast to SAM treatment, it is not systematically given to all children with MAM. Medical treatment of diseases in MAM cases should be through routine health care system.

Cost per child:

CSB++

For a treatment period of 91 days on a daily ration of 300 g (1200 kcal/day), a child needs approx.. 27 kg CSB++. Using UNICEF S0000295 Supercereal Plus (CSB++)/BAG-1KG at USD 2.43, the total cost of the treatment per child equals **USD 66.34**.

LNS

For a treatment period of 91 days on a daily ration of 1 sachet supplementary spread (500 kcal/day), a child needs 91 sachets. Using UNICEF S0000244 Supplementary spread, sachet 92g/CAR-150 at USD 45.58, the total cost of the treatment per child equals **USD 27.65**.

Other programme costs:

Other supplies and equipment

Soap distributed to all beneficiaries
Height boards, scales, MUAC tapes, OTP cards, ration cards, soap.

Training:

Training on supplementary foods (no international module exists)

Logistics

Supplementary foods are bulky to transport, so this needs to be taken into account under programme costs

Other estimates of the cost of treating or preventing MAM include:
The WB e.g. suggests complementary food to prevent and treat moderate malnutrition among children <2y age at about $40-80 per child (WB. (Horton, Shekar, McDonald, Mahal, Brooks). Scaling Up Nutrition. What will it cost? 2010).

The FANTA project has also developed a "CMAM costing tool" which estimated the cost of management of cases with severe acute malnutrition: http://www.fantaproject.org/publications/CMAM_costing_tool.shtml

Personnel time

Monthly visits for weighing and counselling (growth monitoring and promotion). 15 minutes for first visit and then minimum 5 minutes of a nurse, community health worker or nutrition staff after that until end of MAM treatment.

Intervention 134: Infant feeding counselling and support in the context of HIV for prevention of mother-to-child transmission (PMTCT)

Definition:

National or sub-national health authorities should decide whether health services will principally counsel and support mothers known to be HIV-infected to either breastfeed (exclusively for 6 months with continued breastfeeding up to 12 months along with appropriate complementary foods) and receive ARV interventions, or, avoid all breastfeeding, as the strategy that will most likely give infants the greatest chance of HIV-free survival. This decision should be based on international recommendations and consideration of the socio-economic and cultural contexts of the populations served by maternal and child health services; availability and quality of health services; local epidemiology including HIV prevalence among pregnant women; and, main causes of maternal and child under- nutrition and infant and child mortality. Even when ARVs are not available, mothers should be counselled to exclusively breastfeed in the first six months of life and continue breastfeeding thereafter unless environmental and social circumstances are safe for, and supportive of, replacement feeding.

(www.who.int/elena/titles/hiv_infant_feeding/en/index.html, WHO Guideline 2010).

Population in Need:

Infants and young children 0 to 24 months old.

Possible Delivery Channels:

Care may be provided in settings specially designed for infant and young child feeding counselling, at community or facility level, through routine care of HIV-infected mothers and their children. Clinics will provide about 50% of this, and hospitals 50%.

Drugs and Supplies required Per Child:

Costs of ARV are not included here. See HIV module.

As described above breastfeeding is the preferred mode in most situations.

Where commercial infant formula is used, it should be procured, used or distributed following the appropriate national channels and in line with the International Code of Marketing of Breast-milk Substitutes and subsequent WHA resolutions. In this case families need to receive individual training for appropriate use of infant formula. .

Total estimated costs without ARV (covered in HIV module) is 0 USD, which is default in One Health Tool.
If the country recommendation is replacement feeding, the costs of infant formula need to be added.

Personnel:

Clinic staff will need training but because of resource constraints much of the care needed will devolve to families and the community and so resources will also be needed for information and behaviour change at this level.

Other costs (to be covered in programme costs):

Materials: Counseling tools (flip charts, etc.), other material and training on counseling skills should be taken into account in programme costing sections of One Health Tool.

Personnel time: required for counseling sessions (see counseling on breastfeeding) should be taken into account in the human resources sections of One Health Tool.

Training:
WHO-NHD: Integrated IYCF counselling course, the 5-day course for health workers includes a module on infant feeding in the context of HIV

For reference, recent estimates by World Bank suggest the cost of per case for nutritional behaviour change to be $7.50 (Horton et al).

Intervention 135: Nutritional care and support for HIV-infected children

Definition:
Infant and young children need particular nutritional support and care when living with HIV for both the care of children six months to 14 years of age (www.who.int/elena/titles/nutrition_hiv_children/en/index.html] and for the treatment of co-existing severe acute malnutrition in HIV-infected children (www.who.int/elena/titles/hiv_sam/en/index.html).

The management of these children includes antiretroviral therapy as needed, with an appropriate diet to ensure additional energy intake (additional 10% for children who are growing well and 20 - 30% for children with poor weight gain or with increased nutritional needs due to infection, etc.), as well as micronutrient supplementation.

Population in Need:
All children 6 months - 14 years living with HIV infection (WHO. Guidelines for an integrated approach to the nutritional care of HIV-infected children (6 months – 14 years). Preliminary version for country introduction. 2009).

Possible Delivery Channels:
Care may be provided initially through clinics, and later where there are existing programmes, at community or facility level for the routine care of HIV-infected mothers and their children. Clinics will provide about 50% of this, and hospitals 50%.

Drugs and Supplies required Per Child:
Infected children will be taking ART but this will not be included here as a cost.

Costs of nutritional care will include supplements as required e.g. F-75, F-100 or other therapeutic foods in line with management of severe and moderate acute malnutrition. Countries need to estimate the proportion of the HIV infected children who may require management of SAM or management of MAM.
All HIV infected children should receive regular child nutrition and health interventions (counselling, regular prophylactic vitamin A supplements, deworming etc) as needed).

Personnel:
Clinic community level: Follow-up every 1-2 weeks, 10 minutes by nurse or CHW over 2 months

Other costs (to be covered in programme costs):

Materials: Counseling tools (flip charts, etc.), other materials and training on counseling skills should be taken into account in programme costing sections of One Health Tool.

Personnel time: required for counseling sessions should be taken into account in human resources sections of One Health Tool.

Training:
WHO-NHD: Integrated IYCF counselling course, 5-day course for health workers includes a module on infant feeding in the context of HIV
Counselling course for nutrition are and support for HIV infected children (3,5 days) (forthcoming)

Intervention 136: Nutritional care and support for appropriate feeding of infants and young children living in emergencies

Definition:
Infant and young children and their caregivers are particularly vulnerable in emergencies. Emergency relief staff and programme managers should ensure appropriate infant and young child feeding in emergencies. Guiding principles for feeding infants and young children during emergencies are available at www.who.int/nutrition/publications/emergencies/9241546069/en/index.html; and for operational guidance at www.who.int/nutrition/publications/emergencies/operationalguidance/en/index.html and www.who.int/nutrition/publications/emergencies/addendum_operationalguidance/en/index.html

Micronutrient deficiencies can easily develop during an emergency or be made worse if they are already present. This happens because livelihoods and food crops are lost; food supplies are interrupted; diarrhoeal diseases break out, resulting in malabsorption and nutrient losses; and infectious diseases suppress the appetite whilst increasing the need for micronutrients to help fight illness. General food-aid rations should be adequate and well balanced to meet nutrient needs, and should be distributed regularly and in sufficient quantities.
One way to meet the recommended daily intake of micronutrients is to provide foods fortified with micronutrients such as corn-soya blend, biscuits, vegetable oil enriched with vitamin A, and iodized salt, are usually provided as part of food rations during emergencies. The aim is to avert micronutrient deficiencies or prevent them from getting worse among

the affected population. Such foods must be appropriately fortified, taking into account the fact that other unfortified foods will meet a share of micronutrient needs.
However, foods fortified with micronutrients may not meet fully the needs of certain nutritionally vulnerable subgroups such as pregnant and lactating women, or young children. For this reason UNICEF and the WHO have developed the daily multiple micronutrient formula shown in Table 1 to meet the recommended nutrient intake (RNI) of these vulnerable groups during emergencies. (WHO/UNICEF/WFP. Joint statement on preventing and controlling micronutrient deficiencies in populations affected by an emergency. 2007)

Table 1. The composition of multiple micronutrient supplements for children, designed to provide the daily recommended intake of each nutrient i.e. one RNI (WHO/UNICEF/WFP. Joint statement on preventing and controlling micronutrient deficiencies in populations affected by an emergency. 2007).

Micronutrients	**Children (6-59 months)**
Vitamin A µg	400
Vitamin D µg	5.0
Vitamin E mg	5.0
Vitamin C mg	30.0
Thiamine (vitamin B1) mg	0.5
Riboflavin (vitamin B2) mg	0.5
Niacin (vitamin B3) mg	6.0
Vitamin B6 mg	0.5
Vitamin B12 µg	0.9
Folic acid µg	150
Iron mg	10.0
Zinc mg	4.1
Copper mg	0.56
Selenium µg	17.0
Iodine µg	90.0

In emergencies, when breastfeeding is not possible or not done, targeting and use, procurement, management and distribution of infant formula, milk products, bottles and teats should be strictly controlled based on technical advice, and comply with the International Code on Breast-milk Substitutes and subsequent WHA Resolutions

Population in Need:
All children 0-59 months old living in an emergency situation

Delivery Channels:
Care may be provided in settings specially designed for infant and young child feeding counselling, at community or facility level depending on how the emergency is being managed, but most likely through outreach.
100% outreach

Drugs and Supplies required Per Child:

Children 0-5 months:
- Exclusive breastfeeding or when breastfeeding is not possible appropriate breast-milk substitute in line with the interagency operational guidance (this is not costed here)
- Treatment of SAM as necessary

Children 6-59 months:
- Continued breastfeeding, or for infants 6-11 months when breastfeeding is not possible appropriate breast-milk substitute in line with the interagency operational guidance (this is not costed here)
- Counselling for complementary feeding
- Multiple micronutrient supplementation as according to WHO/WFP/UNICEF 2007
- Food rations or supplementary foods as necessary – these are not costed here as it is often provided for through non health sectors
- Management of MAM and SAM as necessary
- Non-health interventions around agriculture and child protection will also be important to align with nutrition interventions.

Costing of multiple micronutrient supplementation
Multiple micronutrient supplementation should be given until the emergency is over. The assumption is made that treatment for the full year. If fortified rations are not being given, then one dose of the supplement as below should be

given once per day. If fortified rations are being given the child should receive two doses per week (WHO/WFP/UNICEF 2007). As both fortified and un-fortified rations are being given, the default in the OneHealth Tool is 50-50% between the two treatment schemes, which needs to be reviewed and adjusted in countries.

Where fortified rations are not given:

- 1 sachet MNP daily for 1 year. Using S0000225 Multiple micrn. pdr,custom sach./PAC-30 at USD 0.52, cost per child per year = USD 6.33

Where fortified rations are given:

- 2 sachets MNP weekly for 1 year. Using S0000225 Multiple micrn. pdr,custom sach./PAC-30 at USD 0.52, cost per child per year = USD 1.80

Personnel and training needs:
Harmonized training package (Nutrition Cluster of the IASC)

Nutrition sensitive interventions,

Many health interventions and interventions in non-health sectors have an impact on nutritional status, these are therefore sometimes called "nutrition-sensitive" interventions and improve the underlying conditions for good nutrition, namely: household food security, healthy environments and access to health services, and adequate caring practices. Countries developing their nutrition plans and budgets using the OneHealthTool need should ensure that the nutrition-sensitive interventions also are being implemented.

Examples of nutrition sensitive interventions from other modules in the OneHealth Tool are:

Maternal, newborn and Reproductive Health

- Many of the interventions targeted at pregnant women in the nutrition module assume that the intervention "Basic ANC" is implemented. The additional time required for delivering nutrition interventions is added to costs of ANC.
- "Family planning" is important in order to prevent adolescent pregnancy and ensure appropriate spacing between pregnancies
- "Deworming of pregnant women" has been found to have a small positive effect on anaemia in pregnant women (Bhutta et al. 2008), although an updated review found non-significant effects of one dose of anthelmintic on maternal anaemia, LBW, preterm birth and perinatal mortality (Bhutta et al 2013). See also: http://www.who.int/elena/titles/deworming/en/index.html
- "Optimal timing of cord-clamping" is important to reduce risk of anaemia in the infant. There is a strong evidence base for this intervention (http://www.who.int/elena/titles/cord_clamping/en/index.html).

Malaria module

- "Insecticide-treated materials", "ITN (pregnant women)", "IPT (pregnant women)" and other interventions to reduce impact of malaria on pregnancy outcomes: intermittent preventive treatment of malaria in pregnancy and the provision of insecticide-treated bed nets; and in young children are important to prevent malnutrition. Pregnant women who become infected by the malaria parasite are more likely to miscarry, and if the foetus survives he/she is more likely to be a low birth weight neonate with all the health, nutritional and developmental impacts risks that this brings. IPT and the use of insecticide treated bednets result in a reduction of risk of severe anaemia and low birth weight infants (Bhutta et al. 2013).

NCD module

- Preventative interventions such as reduction of indoor air pollution and tobacco use, especially in pregnancy, is important to ensure maternal and child birth outcomes.

Child health module

- "Deworming of children and adolescents" is important to prevent the nutritional impairment caused by soil-transmitted helminths, which is recognized to have a significant impact on growth and physical development. In addition to their nutritional effects, soil-transmitted helminth infections are also reported to impair cognitive development, limit educational advancement and hinder economic development. http://www.who.int/elena/titles/deworming/en/index.html

WASH module

- Hygiene and sanitation measures such as hand washing are crucial to creating the healthy environments that are necessary for ensuring good nutrition status. WASH interventions such as hand washing, water quality treatment, sanitation and health education, have been found to decrease diarrhoea episodes in children (Bhutta et al. 2013). See also http://www.who.int/elena/titles/wsh_diarrhoea/en/index.html

NON-COMMUNICABLE DISEASES

Intervention 137: Screen for risk of Cardiovascular Disease and Diabetes

Definition:

Target Population: Population of ages 40 and up

Population in Need: 100% of target population

Possible Delivery Channels: 100% through clinic

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	No. of days	Price
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 5 minutes of nurse time

Visits or Inpatient Time Required per Case: 1 outpatient visit

Source: WHO. 2012. NCD Costing Tool

Intervention 138: Follow up care for those at low risk of CVD and Diabetes

Definition: Follow up care for those found to have 10-20% risk of CVD or diabetes during screening

Target Population: Adults 40 and up

Population in Need:

	Low risk (10-20%)			
	<50	50-59	60-69	70+
West Africa	2.43%	9.84%	9.65%	24.66%
East and Southern Africa	2.73%	9.71%	13.51%	23.25%
Latin America and Caribbean	1.44%	6.38%	20.82%	35.92%
Asia	0.86%	6.91%	23.57%	35.94%
North Africa Middle East	0.70%	9.20%	30.24%	31.81%
Europe	1.88%	9.19%	21.23%	22.12%

Possible Delivery Channels: 100% Clinic

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	No. of days	Price
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 5 minutes of nurse time

Visits or Inpatient Time Required per Case: 1 outpatient visit per year

Source: WHO. 2012. NCD Costing Tool

Intervention 139: Treat those with very high cholesterol but low absolute risk

Definition: People with low risk (less than 20%) of cardiovascular disease or diabetes, but with high cholesterol (Total Cholesterol>=8mmol/l)

Target Population: People with low risk (less than 20%) of cardiovascular disease or diabetes

Population in Need:

Table: Prevalence of high blood pressure and cholesterol

	Prevalence per 100 of high cholesterol in Pop 25+	Prevalence per 100 of high blood pressure in Pop 25+
Afghanistan	0.278	5.219253
Albania	3.192	14.22007
Algeria	3.832	7.586022
Andorra	3.826	5.6511
Angola	2.734	7.883837
Antigua and Barbuda	1.573	8.563841
Argentina	2.123	6.572149
Armenia	2.704	16.26881
Australia	0.406	2.634785
Austria	3.017	6.017632
Azerbaijan	1.954	12.45281
Bahamas	2.116	7.810307
Bahrain	0.210	3.814445
Bangladesh	0.455	4.36982
Barbados	1.601	8.699531
Belarus	1.594	8.336866
Belgium	3.399	5.298749
Belize	0.972	5.749466
Benin	1.519	7.931724
Bhutan	0.577	4.546822
Bolivia	0.143	3.17827
Bosnia and Herzegovina	2.588	16.57977
Botswana	3.738	8.645429
Brazil	1.609	8.053889
Brunei Darussalam	0.380	1.970977
Bulgaria	4.042	16.21432
Burkina Faso	1.308	7.693661
Burundi	1.425	8.989036
Cambodia	0.146	1.206448
Cameroon	1.729	7.297292
Canada	0.417	1.881442
Cape Verde	1.869	9.785983
Central African Republic	1.799	8.527334
Chad	1.332	7.353318
Chile	1.880	8.854107

China	0.198	1.910857
Colombia	1.358	7.186865
Comoros	1.893	8.32229
Congo, Democratic Republic of the	2.547	7.686227
Cook Islands	0.499	2.276751
Costa Rica	1.401	6.581004
Côte d'Ivoire	1.659	8.727039
Croatia	2.220	9.470492
Cuba	0.170	4.085076
Cyprus	0.274	3.439691
Czech Republic	2.363	8.143026
Democratic People's Republic of Korea	0.518	4.68133
Denmark	4.210	5.450246
Djibouti	0.577	6.85676
Dominica	1.315	10.06908
Dominican Republic	0.951	7.809199
Ecuador	0.171	3.470768
Egypt	0.664	5.750841
El Salvador	1.029	5.696075
Equatorial Guinea	4.533	9.363103
Eritrea	1.589	6.063523
Estonia	1.998	9.253355
Ethiopia	1.659	6.755148
Fiji	0.371	2.027698
Finland	3.336	7.319726
France	3.261	5.927078
Gabon	4.766	8.531524
Gambia	1.612	8.558258
Georgia	2.378	16.60226
Germany	4.014	6.694427
Ghana	1.379	7.159193
Greece	2.019	5.802914
Grenada	1.058	8.039563
Guatemala	0.098	2.955113
Guinea	1.425	8.554531
Guinea-Bissau	1.285	8.180242
Guyana	0.636	7.640169
Haiti	0.075	3.518645
Honduras	0.815	6.350444
Hungary	1.919	8.315525
Iceland	4.421	4.732789
India	0.489	3.88206
Indonesia	0.073	4.360905
Iran, Islamic Republic of	0.200	3.289955
Iraq	0.717	5.625347
Ireland	3.150	6.203235
Israel	2.067	4.505812

Italy	3.145	6.597456
Jamaica	0.829	7.732823
Japan	0.374	3.302052
Jordan	0.159	2.514844
Kazakhstan	1.186	6.971264
Kenya	2.196	7.479088
Kiribati	0.196	1.676861
Kuwait	0.212	2.544864
Kyrgyzstan	1.527	12.68878
Lao People's Democratic Republic	0.164	1.561647
Latvia	1.939	8.774289
Lebanon	0.155	3.864754
Lesotho	1.893	8.730747
Liberia	1.168	7.923121
Libyan Arab Jamahiriya	0.096	4.753926
Lithuania	1.799	8.943977
Luxembourg	3.890	5.523588
Madagascar	1.986	8.8542
Malawi	1.869	9.50096
Malaysia	0.391	1.695141
Maldives	0.924	4.412867
Mali	1.472	6.78164
Malta	2.966	6.124545
Marshall Islands	0.308	1.620923
Mauritania	1.729	8.086322
Mauritius	5.935	9.484219
Mexico	1.866	5.975663
Micronesia (Federated States of)	0.316	2.050372
Monaco	3.607	5.773529
Mongolia	0.194	2.310704
Montenegro	3.732	16.25738
Morocco	0.599	7.644423
Mozambique	2.079	9.997534
Myanmar	0.582	5.391231
Namibia	3.084	9.407967
Nauru	0.290	2.203848
Nepal	0.391	4.381351
Netherlands	2.959	5.841476
New Zealand	0.386	2.65903
Nicaragua	0.102	3.222778
Niger	1.075	10.67383
Nigeria	1.145	9.181287
Niue	0.439	1.952715
Norway	3.122	6.991716
occupied Palestinian territory	Missing	Missing
Oman	0.181	3.335361
Pakistan	0.437	5.858115

Palau	0.428	1.886253
Panama	1.401	6.890999
Papua New Guinea	0.212	1.176147
Paraguay	1.223	7.086985
Peru	0.147	2.7334
Philippines	0.268	1.594608
Poland	4.817	15.94891
Portugal	2.570	7.339433
Qatar	0.230	3.041616
Republic of Korea	0.262	1.127879
Romania	3.317	15.61999
Russian Federation	1.607	7.491018
Rwanda	1.799	9.017401
Saint Kitts and Nevis	1.501	9.838917
Saint Lucia	1.223	7.97009
Saint Vincent and The Grenadines	1.115	7.517305
Samoa	0.207	2.142578
San Marino	3.607	5.773529
Sao Tome and Principe	1.285	9.974749
Saudi Arabia	0.110	3.204044
Senegal	1.706	8.380874
Serbia	3.482	16.58864
Seychelles	8.107	9.319165
Sierra Leone	1.215	9.538613
Singapore	0.435	2.778554
Slovakia	4.253	15.47017
Slovenia	2.780	9.166646
Solomon Islands	0.174	1.485739
Somalia	0.324	7.18293
South Africa	3.435	8.836995
Spain	2.447	5.732602
Sri Lanka	0.081	4.194189
Sudan	0.494	7.253722
Suriname	1.115	7.545172
Swaziland	2.827	8.693557
Sweden	2.449	6.526788
Switzerland	2.986	5.250996
Syrian Arab Republic	0.121	3.394625
Tajikistan	1.100	11.99909
Tanzania, United Republic of	1.869	7.979147
Thailand	0.152	3.313905
The former Yugoslav Republic of Macedonia	2.978	15.08679
The Republic of Moldova	0.887	8.01022
The Republic of the Congo	2.547	8.407608
Timor-Leste	0.134	1.593273
Togo	1.262	8.235341
Tonga	0.325	2.109273

Trinidad and Tobago	1.323	7.693561
Tunisia	0.131	4.02228
Turkey	2.189	8.466836
Turkmenistan	1.880	12.04445
Tuvalu	0.251	1.79076
Uganda	1.729	8.944634
Ukraine	1.252	8.983604
United Arab Emirates	0.211	2.226729
United Kingdom of Great Britain & Northern Ireland	3.326	5.890655
United States of America	0.343	2.233098
Uruguay	1.544	9.229604
Uzbekistan	1.252	9.571573
Vanuatu	0.213	2.373267
Venezuela	1.251	7.464305
Viet Nam	0.206	1.623574
Yemen	0.461	5.757798
Zambia	2.196	8.577316
Zimbabwe	1.916	8.126997

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	No. of days	Price
Simvastatin (15 mg)	*100%*	1	1	365	0.04
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 2 visits with a doctor, 10 minutes each. One visit with a nurse, 10 minutes.

Visits or Inpatient Time Required per Case: 3 outpatient visits
Source: WHO. 2012. NCD Costing Tool

Intervention 140: Treat those with very high blood pressure but low absolute risk (<20%)

Definition: People with low risk (less than 20%) of cardiovascular disease or diabetes, but with very high blood pressure (SBP>=160 OR DBP>=100)

Target Population: People with low risk (less than 20%) of cardiovascular disease or diabetes

Population in Need: See previous table

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:

Name	% use	Number of units	Times per day	No. of days	Price
Hydrochlorothiazide (25 mg/tab)	95%	1	1	365	0.00
Enalapril (20 mg/tab)	40%	1	1	365	0.01
Atenolol (50 mg/tab)	25%	1.5	1	365	0.01

Amlodipine (10 mg/tab)	25%	.5	1	365	0.19

Laboratory tests per client:

	% use	Number of units	Times per day	Days per case	Price
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 2 visits with a doctor, 10 minutes each. One visit with a nurse, 10 minutes.

Visits or Inpatient Time Required per Case: 3 outpatient visits

Source: WHO. 2012. NCD Costing Tool

Intervention 141: Treat those with 20-30% risk of CVD

Definition:

Target Population: Population 40 and above

Population in Need:

	20-30% risk			
	<50	50-59	60-69	70+
West Africa	0.23%	3.85%	16.35%	13.99%
East and Southern Africa	0.74%	3.80%	12.18%	15.47%
Latin America and Caribbean	0.33%	3.59%	9.15%	18.62%
Asia	0.30%	2.95%	11.46%	16.88%
North Africa Middle East	0.15%	3.77%	13.70%	24.18%
Europe	0.83%	6.26%	15.68%	18.41%

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:
Apart from some people with contraindications, most cases will receive Hydrochlorothiazide (alone or in combination with Enalapril or a CCB)

Name	% use	Number of units	Times per day	No. of days	Price
Hydrochlorothiazide (25 mg/tab)	95%	1	1	365	0.00
Enalapril (20 mg/tab)	40%	1	1	365	0.01
Atenolol (50 mg/tab)	25%	1.5	1	365	0.01
Amlodipine (10 mg/tab)	40%	.5	1	365	0.19
Simvastatin (15mg tab)	100%	1	1	365	0.04
Prednisolone (5 mg tab)	7%	8	1	14	0.008

	% use	Number of units	Times per day	Days per case	Price
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 100% will have 3 visits with a doctor, 10 minutes each

7% will also get 4 twenty minute visits with a nurse to manage complications due to diabetes.

Visits or Inpatient Time Required per Case: 93%: 3 outpatient visits per year
7%: 7 outpatient visits per year

Source: WHO. 2012. NCD Costing Tool

Intervention 142: Treat those with high risk of CVD

Definition: Treatment for those with high risk of cardiovascular disease (greater than 30%)

Target Population: People over 40

Population in Need:

	>30% risk			
	<50	50-59	60-69	70+
West Africa	0.18%	1.54%	9.97%	18.88%
East and Southern Africa	0.82%	1.61%	3.24%	3.89%
Latin America and Caribbean	0.30%	3.24%	9.29%	19.57%
Asia	0.22%	2.86%	11.03%	19.70%
North Africa Middle East	0.13%	4.33%	23.02%	37.81%
Europe	0.62%	6.34%	23.77%	42.83%

Possible Delivery Channels: 50% clinic, 50% hospital

Drugs and Supplies required Per Client:

Name	% use	Number of units	Times per day	No. of days	Price
Hydrochlorothiazide (25 mg/tab)	95%	1	1	365	0.00
Enalapril (20 mg/tab)	40%	1	1	365	0.01
Atenolol (50 mg/tab)	25%	1.5	1	365	0.01
Amlodipine (10 mg/tab)	40%	.5	1	365	0.19
Simvastatin (15mg tab)	100%	1	1	365	0.04
Prednisolone (1mg)	7%	30	1	14	0.07

	% use	Number of units	Times per day	Days per case	Price
Blood glucose test	30%	1	1	1	2.00
Cholesterol test	30%	1	1	1	2.00
Urine analysis	30%	1	1	1	1.83
Urine sugar analysis	100%	1	1	1	0.67

Personnel Time Required per Case: 100% will receive 4 ten minute visits with a doctor
7% will also get 4 twenty minute visits with a nurse to manage complications due to diabetes.

Visits or Inpatient Time Required per Case: 93%: 4 outpatient visits per year
7%: 8 outpatient visits per year

Source: WHO. 2012. NCD Costing Tool

Intervention 143: Treat new cases of acute myochardial infection (AMI) with aspirin

Definition: Treat new cases of acute myocardial infarction (AMI) with aspirin

Target Population: Disaggregated by age. See population in need for details

Population in Need: Prevalence per 100

	0-4	5-14	15-29	30-44	45-59	60-69	70-79	80+
West Africa	0.00	0.00	0.00	0.03	0.16	0.36	0.47	0.66
East and Southern Africa	-	0.00	0.00	0.02	0.16	0.35	0.47	0.65
Latin America and Caribbean	0.00	0.00	0.00	0.02	0.11	0.27	0.40	0.62
Asia	0.00	0.00	0.00	0.03	0.14	0.29	0.37	0.53
North Africa Middle East	0.00	0.00	0.00	0.03	0.18	0.47	0.71	0.92
Europe	0.00	0.00	0.00	0.07	0.37	0.85	1.31	1.74

Possible Delivery Channels:

Drugs and Supplies required Per Client:

	% use	Number of units	Times per day	Days per case	Price	Notes
Acetyl salysilic acid (aspirin), 75 mg tab	100	1	1	365	.0143	
Oxygen	100	5.76	1440	1	$2.15	4 litres per minute (5.76 cubic metres), for 24 hours
IV line	100	1	1	2	$0.95	
Saline solution	100	1	2	14	$.90 per litre	

Personnel Time Required per Case: 100% will receive 1 twenty minute visits with a doctor and 4 ten minute visits with a nurse

Visits or Inpatient Time Required per Case: 5 outpatient visits per year; 2 inpatient days

Source: WHO. 2012. NCD Costing Tool

Intervention 144: Treat cases with established ischaemic heart disease (IHD) and post MI

Definition: Treatment for established ischaemic heart disease (IHD) and post MI

Target Population: Total population; risk varies by age.

Population in Need: Prevalence per 100

	0-4	**5-14**	**15-29**	**30-44**	**45-59**	**60-69**	**70-79**	**80+**
West Africa	-	-	-	0.02	0.3	1.32	2.4	2.7
East and Southern Africa	-	-	-	0.02	0.3	1.32	2.4	2.7
Latin America and Caribbean	-	-	0	0.06	0.34	1.11	1.92	2.2
Asia	-	-	0	0.14	0.72	2.08	3.31	3.28
North Africa Middle East	-	-	0.01	0.13	0.63	1.65	2.58	3.11
Europe	-	-	0	0.14	0.7	2.37	4.05	4.66

Possible Delivery Channels: 100% hospital

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	Days per case	Price
Acetyl salicylic acid (75 mg/tab)	*100%*	1	1	365	$.0143

Enalapril (20 mg/tab)	*100%*	1	1	365	$0.01
Atenolol (50 mg/tab)	*100%*	1.5	1	365	$0.01
Simvastatin (15mg tab)	*100%*	1	1	365	$0.04
Prednisolone (1mg)	*13%*	30	1	14	$0.07
Blood glucose test (strip)	13%	1	1	20	$2.00
Cholesterol test	100%	1	1	2	$2.00
Urine analysis	100%	1	1	2	$1.83
Blood glucose test (strip)	87%	1	1	2	$2.00

Personnel Time Required per Case: 100% get 6 five minute visits with a physician; 13% get an additional 4 twenty minute visits with a nurse.

Visits or Inpatient Time Required per Case: 87% have 6 outpatient visits; 13% have 10 outpatient visits.

Intervention 145: Treat those with established cerebrovascular disease and post stroke

Definition: Treatment for those with established cerebrovascular disease and post stroke care.

Target Population: Total population.

Population in Need: Varies by age

	0-4	5-14	15-29	30-44	45-59	60-69	70-79	80+
West Africa	-	0.00	0.05	0.22	0.79	1.52	2.56	3.97
East and Southern Africa	0.00	0.00	0.00	0.04	0.23	0.74	1.03	1.62
Latin America and Caribbean	0.00	0.01	0.04	0.23	0.72	1.25	1.75	2.66
Asia	0.00	0.01	0.04	0.16	0.68	1.72	2.45	3.93
North Africa Middle East	0.00	0.01	0.05	0.16	0.49	1.17	2.16	3.29
Europe	0.00	0.01	0.09	0.51	1.68	4.06	6.49	8.46

Possible Delivery Channels: 100% hospital

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	Days per case	Price
Acetyl salicylic acid (75 mg/tab)	*100%*	1	1	365	$.0143
Enalapril (20 mg/tab)	*100%*	1	1	365	$0.01
Atenolol (50 mg/tab)	*100%*	1.5	1	365	$0.01
Simvastatin (15mg tab)	*100%*	1	1	365	$0.04
Prednisolone (1mg)	*13%*	30	1	14	$0.07
Blood glucose test (strip)	13%	1	1	20	$2.00
Cholesterol test	100%	1	1	2	$2.00
Urine analysis	100%	1	1	2	$1.83
Blood glucose test (strip)	87%	1	1	2	$2.00

Personnel Time Required per Case: 100% get 6 five minute visits with a physician; 13% get an additional 4 twenty minute visits with a nurse. An additional 20% will also require 4 twenty minute meetings with a nurse for physiotherapy.

Visits or Inpatient Time Required per Case: 33% have 10 outpatient visits; 67% have 6 outpatient visits ; 100% 2 inpatient days

Intervention 146: Rheumatic Heart Disease

Definition: Treat cases with rheumatic heart disease (with benzathine penicillin)

Target Population: Ages 5-19

Population in Need:

West Africa	6.40
East and Southern Africa	6.40
Latin America and Caribbean	2.90
Asia	6.08
North Africa Middle East	5.10
Europe	5.4

Possible Delivery Channels: 50% clinic; 50% hospital

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	Days per case	Price
Penicillin G benzathine (1440mg)	*100%*	2.5	1	12	$0.289

Personnel Time Required per Case: 2 visits of 20 minutes each with a doctor; monthly (12) visits of ten minutes each with a nurse.

Visits or Inpatient Time Required per Case: 14 outpatient visits; 2 inpatient days

Source: WHO. 2012. NCD Costing Tool; MSH Drug Price Indicator Guide 2011

Intervention 147: Treat cases with Type I diabetes

Definition: Care for those members of the population with Type I diabetes.

Target Population: Adults 20+

Population in Need:

Afghanistan	0.7%
Albania	0.8%
Algeria	0.7%
Andorra	0.8%
Angola	1.0%
Antigua and Barbuda	0.5%
Argentina	0.9%
Armenia	0.8%
Australia	1.1%
Austria	0.9%
Azerbaijan	1.0%
Bahamas	0.8%
Bahrain	1.4%
Bangladesh	1.5%
Barbados	0.7%
Belarus	1.5%
Belgium	0.8%
Belize	1.2%
Benin	0.8%

Bhutan	0.5%
Bolivia	0.5%
Bosnia and Herzegovina	0.6%
Botswana	0.8%
Brazil	0.6%
Brunei Darussalam	1.2%
Bulgaria	1.2%
Burkina Faso	0.9%
Burundi	0.3%
Cambodia	0.3%
Cameroon	0.6%
Canada	0.6%
Cape Verde	1.0%
Central African Republic	0.6%
Chad	0.4%
Chile	0.5%
China	0.7%
Colombia	0.5%
Comoros	0.6%
The Republic of the Congo	0.5%
Cook Islands	0.6%
Costa Rica	0.7%
Côte d'Ivoire	0.8%
Croatia	0.6%
Cuba	1.0%
Cyprus	1.0%
Czech Republic	1.1%
Democratic People's Republic of Korea	0.9%
Congo, Democratic Republic of the	0.4%
Denmark	1.1%
Djibouti	0.7%
Dominica	0.7%
Dominican Republic	1.6%
Ecuador	0.9%
Egypt	0.9%
El Salvador	1.1%
Equatorial Guinea	0.8%
Eritrea	0.5%
Estonia	0.4%
Ethiopia	1.0%
Fiji	0.5%
Finland	0.7%
France	0.8%
Gabon	1.3%
Gambia	0.6%
Georgia	0.5%
Germany	1.0%

Ghana	1.0%
Greece	0.5%
Grenada	1.3%
Guatemala	1.4%
Guinea	0.8%
Guinea-Bissau	0.5%
Guyana	0.5%
Haiti	1.1%
Honduras	1.1%
Hungary	0.8%
Iceland	1.1%
India	0.5%
Indonesia	0.9%
Iran (Islamic Republic of)	0.5%
Iraq	1.0%
Ireland	1.2%
Israel	0.7%
Italy	0.7%
Jamaica	1.0%
Japan	0.6%
Jordan	0.8%
Kazakhstan	1.1%
Kenya	0.8%
Kiribati	0.6%
Kuwait	0.9%
Kyrgyzstan	2.0%
Lao People's Democratic Republic	0.6%
Latvia	0.7%
Lebanon	1.0%
Lesotho	0.8%
Liberia	0.6%
Libyan Arab Jamahiriya	0.7%
Lithuania	1.2%
Luxembourg	0.8%
Madagascar	1.0%
Malawi	0.3%
Malaysia	0.6%
Maldives	1.4%
Mali	0.6%
Malta	0.4%
Marshall Islands	1.4%
Mauritania	0.7%
Mauritius	0.9%
Mexico	1.5%
Micronesia (Federated States of)	1.4%
Monaco	1.1%
Mongolia	1.1%

Montenegro	0.3%
Morocco	1.0%
Mozambique	0.7%
Myanmar	0.3%
Namibia	0.5%
Nauru	1.5%
Nepal	1.8%
Netherlands	0.3%
New Zealand	1.0%
Nicaragua	1.0%
Niger	0.9%
Nigeria	0.5%
Niue	0.5%
Norway	0.3%
Oman	0.9%
Pakistan	1.5%
Palau	1.1%
Panama	1.0%
Papua New Guinea	1.0%
Paraguay	0.4%
Peru	0.7%
Philippines	0.8%
Poland	1.0%
Portugal	1.2%
Qatar	1.4%
Republic of Korea	0.6%
The Republic of Moldova	0.6%
Romania	1.3%
Russian Federation	1.0%
Rwanda	0.9%
Saint Kitts and Nevis	1.1%
Saint Lucia	1.1%
Saint Vincent and the Grenadines	1.1%
Samoa	0.3%
San Marino	1.0%
Sao Tome and Principe	1.0%
Saudi Arabia	0.9%
Senegal	1.5%
Serbia	0.6%
Seychelles	1.2%
Sierra Leone	1.7%
Singapore	0.6%
Slovakia	1.6%
Slovenia	1.0%
Solomon Islands	0.6%
Somalia	0.5%
South Africa	0.4%

Spain	0.5%
Sri Lanka	1.2%
Sudan	1.1%
Suriname	0.7%
Swaziland	1.0%
Sweden	0.6%
Switzerland	1.0%
Syrian Arab Republic	1.2%
Tajikistan	1.5%
Thailand	0.9%
The former Yugoslav Republic of Macedonia	0.9%
Timor-Leste	0.7%
Togo	0.3%
Tonga	0.6%
Trinidad and Tobago	1.4%
Tunisia	1.2%
Turkey	1.0%
Turkmenistan	0.9%
Tuvalu	1.0%
Uganda	1.3%
Ukraine	0.5%
United Arab Emirates	1.7%
United Kingdom of Great Britain & Northern Ireland	1.1%
Tanzania, United Republic of	0.8%
United States of America	0.9%
Uruguay	0.6%
Uzbekistan	1.4%
Vanuatu	0.5%
Venezuela	0.5%
Viet Nam	0.7%
Yemen	0.5%
Zambia	0.3%
Zimbabwe	0.4%

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	Days per case	Price	Notes
Insulin	*100%*	1	1	365	.898	MSH Drug Price Indicator Guide 2011
Syringe	100%	1	1	365	.05	

Personnel Time Required per Case: 2 20 minute visits with a doctor

Visits or Inpatient Time Required per Case: 2 outpatient visits

Source: WHO. 2012. NCD Costing Tool

Intervention 148: Screen to prevent diabetic foot

Definition: Screening and prevention of foot problems in patients with diabetes mellitus

Target Population: Adults 20+

Population in Need: Same as diabetes treatment

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:

Name (generic)	% use	Number of units	Times per day	Days per case	Price	Notes
Metformin (500 mg tab)	100%	4	1	365	.01	MSH drug price indicator price

Personnel Time Required per Case: 2 fifteen minute visits with a nurse

Visits or Inpatient Time Required per Case: 2 outpatient visits per case
Source: WHO. 2012. NCD Costing Tool; MSH Drug Price Indicator Guide 2011

Breast Cancer Screening and Treatment

Intervention 149: Basic breast cancer awareness

Definition: Basic awareness raising, including information on self breast exams

Target Population: Women 25-70

Population in Need: 100%

Possible Delivery Channels: 50% outreach, 50% clinic

Drugs and Supplies required Per Client: None required

Personnel Time Required per Case: 5 minutes of nurse time

Visits or Inpatient Time Required per Case: 1 outpatient visit

Source:

Intervention 150: Clinical breast examination

Definition: An exam of the breast performed by a health care provider to check for lumps or other changes.

Target Population: Women 25+

Population in Need: 100%

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client: None

Personnel Time Required per Case: 5 minutes of nurse time

Visits or Inpatient Time Required per Case: 1 outpatient visit per client

Source:

Intervention 151: Mammography

Definition: Use of X-rays to diagnose and locate breast tumors.

Target Population: Women 40+

Population in Need: 100%

Possible Delivery Channels: 100% hospital

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	No. of days	Price
X-ray film	100	4	1	1	$.64
X-ray film chemistry	100	1	1	1	$0.064

X-ray machines, viewing boxes, etc, are assumed to be covered as part of the equipment purchased for facilities, and used for various services.

Personnel Time Required per Case:

Staff type	Percent treated by	Note	Minutes	Number of days/visits
Radiographer/X-ray technicial	100		45	1

Visits or Inpatient Time Required per Case: 1 inpatient visit

Source:

Intervention 152: Breast cancer treatment: Stage 1

Definition: This includes evaluation, treatment for persons with Stage 1 cancer, including lumpectomy with axillary dissection and radiotherapy. Eligible patients receive tamoxifen or chemotherapy, and follow-up surveillance.

Initial evaluation	Surveillance
History and physical exam, in an outpatient visit	Bi-annual history and physical exam every 4-6 months for first 5 years, in an outpatient visit
	Annual history and physical exam every year after year 5, in an outpatient visit
Bilateral mammography	Bilateral mammography 6 months post local treatment
Complete blood count	Bilateral mammography every year
Total bilirubin	
Alkaline phosphatase	If on Tamoxifen, pelvic exam each year if uterus present
Fine needle aspiration or core biopsy	
ECG if >60	
If changes in liver function tests	
Bone scan	
Ultrasound of the liver	
No hospitalization for initial evaluation	No hospitalization during follow-up

Target Population: Women with breast cancer

Prevalence of breast cancer:

	0-4	5-14	15-29	30-44	45-59	60-69	70-79	80+
West Africa	0%	0%	0%	8%	16%	32%	34%	41%
East and Southern Africa	0%	0%	1%	14%	30%	64%	76%	86%
Latin America and Caribbean	0%	0%	1%	18%	39%	36%	36%	31%
Asia	0%	0%	1%	25%	44%	36%	25%	30%
North Africa Middle East	0%	0%	1%	20%	33%	26%	23%	16%
Europe	0%	0%	1%	31%	59%	66%	59%	53%

Population in Need: 9.44 % of women with breast cancer are assumed to be in Stage 1 in Regions D and E, which corresponds to developing country prevalence rates.

Stage	Prevalence for Regions A, B and C	Prevalence for Regions D and E
Stage 1	49.00%	9.44%
Stage 2	37.44%	14.17%
Stage 3	8.61%	57.97%
Stage 4	4.95%	18.42%

Possible Delivery Channels: 100% hospital

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Note	Number of units	Times per day	No. of days	Price
Mammogram						
X-ray film	100		4	1	1	$.64
X-ray film chemistry	100		1	1	1	$0.064
Complete blood count/haemogram						
Syringe, needle and swab	100		1	1	1	.08
Complete blood count/haemogram Reagents and control	100		1	1	1	2.52
Blood collecting tube, 5 ml	100		1	1	1	.24
Total bilirubin						
Diazortized Re-agent	100		1	1	1	.41
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Alkaline phosphatase						
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Re-agents required for alkaline phosphatase	100		1	1	1	10.96
Pipettes	100		1	1	1	.04
Buffer solutions	100		1	1	1	.20
Fine needle aspiration						
Aspirating needles	50		1	1	1	22.40

Aspirating syringe	50		1	1	1	22.42
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
Biopsy						
Scalpel blade, disposable	50		1	1	1	.16
Biopsy needle	50		1	1	1	22.41
Saline solution, 9%, 20 ml	50		1	1	1	.09
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
ECG if >60						
Electrodes, Electrocardiographic	50		12	1	1	.09
Gel, Electrode	50		1	1	1	.27
Paper, Recording, ECG	50		1	1	1	.03
Bone scan						
X-ray film	25		4	1	1	$.64
Butylscopolamine	25	one ampoule of 1ml, 20mg	1	1	1	$0.09
Liver ultrasound						
X-ray film	25		3	1	1	$.64
Syringe, needle and swab	25		2	1	1	.08
Developer chemicals	25		5	1	1	.43
Fixing chemicals	25		5	1	1	.43
Lumpectomy						
Scalpel blade, disposable	100		5	1	1	.16
Sponges	100		25	1	1	.04
Sutures	100		8	1	1	.66
Wound drainage kit	100		2	1	1	26.55
Radiotherapy						
X-ray film	100		3	1	1	$.64

Personnel Time Required per Case:

Staff type	Percent treated by	Note	Minutes	Number of days/visits
General				
Other specialist doctor	100	Pathologist	60	1
Radiographer/X-ray technicial	100	Mammogram	45	1
Evaluation				
Lab technician/assistants	100	Haemogram, bilirubin, phosphatase	135	1
Needle aspiration				
Nurse	50		15	1
Other specialist doctor	50		10	1

Biopsy				
Nurse	50		15	1
Other specialist doctor	50		10	1
ECG				
Other specialist doctor	50	Cardiologist	10	1
Laboratory technician/assistant	50		25	1
Bone density scan				
Radiographer/X-ray technician	25		45	1
Liver Ultrasound				
Nurse	25		25	1
Radiographer/X-ray technician	25		25	1
Other specialist doctor	25		35	1
Lumpectomy				
Clinical officer/surgical technician	100		105	1
Nurse	100		105	1
Other specialist doctor	100	Surgeon	105	1
Assistant nurse	100		105	1
Radiotherapy				
Radiographer/X-ray technician	100		90	1
Other specialist doctor	100	Oncologist	52.5	1

Visits or Inpatient Time Required per Case: 2 inpatient days; XX outpatient visits
Source:

Intervention 153: Breast cancer treatment: Stage 2

Definition: Lumpectomy with axillary dissection and radiotherapy. Eligible patients receive tamoxifen or chemotherapy.

Target Population: Women with breast cancer

Population in Need: 14.17 % of women with breast cancer are assumed to be in Stage 2 in Regions D and E, which corresponds to developing country prevalence rates.

Stage	Prevalence for Regions A, B and C	Prevalence for Regions D and E
Stage 1	49.00%	9.44%
Stage 2	37.44%	14.17%
Stage 3	8.61%	57.97%
Stage 4	4.95%	18.42%

Possible Delivery Channels:

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Note	Number of units	Times per day	No. of days	Price
Mammogram						
X-ray film	100		4	1	1	$.64
X-ray film chemistry	100		1	1	1	$0.064

Complete blood count/haemogram						
Syringe, needle and swab	100		1	1	1	.08
Complete blood count/haemogram Reagents and control	100		1	1	1	2.52
Blood collecting tube, 5 ml	100		1	1	1	.24
Total bilirubin						
Diazortized Re-agent	100		1	1	1	.41
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Alkaline phosphatase						
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Re-agents required for alkaline phosphatase	100		1	1	1	10.96
Pipettes	100		1	1	1	.04
Buffer solutions	100		1	1	1	.20
Fine needle aspiration						
Aspirating needles	50		1	1	1	22.40
Aspirating syringe	50		1	1	1	22.42
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
Biopsy						
Scalpel blade, disposable	50		1	1	1	.16
Biopsy needle	50		1	1	1	22.41
Saline solution, 9%, 20 ml	50		1	1	1	.09
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
ECG if >60						
Electrodes, Electrocardiographic	50		12	1	1	.09
Gel, Electrode	50		1	1	1	.27
Paper, Recording, ECG	50		1	1	1	.03
Bone scan						
X-ray film	25		4	1	1	$.64
Butylscopolamine	25	one ampoule of 1ml, 20mg	1	1	1	$0.09
Liver ultrasound						
X-ray film	25		3	1	1	$.64
Syringe, needle and swab	25		2	1	1	.08
Developer chemicals	25		5	1	1	.43
Fixing chemicals	25		5	1	1	.43
Lumpectomy						

Scalpel blade, disposable	100		5	1	1	.16
Sponges	100		25	1	1	.04
Sutures	100		8	1	1	.66
Wound drainage kit	100		2	1	1	26.55
Radiotherapy						
X-ray film	100		3	1	1	$.64
(neo) adjuvant chemotherapy						
Doxorubicin, 50 mg vial	100	Four 21 day cycles, 60 mg/m2	2	1	4	$19.40
Doxorubicin, 10 mg vial	100	Four 21 day cycles, 60 mg/m2	1	1	4	$6.24
Cyclophosphamide, 1 g	100	Four 21 day cycles, 2 vials of 1g, 1 of 500 mg	1	1	4	6.39
Cyclophosphamide, 500 mg	100		1	1	4	9.49
Dexamethasone, 4 mg per ampoule	100		1	1	4	.15
Tamoxifen, 20 mg tablet	50	For hormone receptor (ER) positive patients	1	1	365	.13
Cannulae	100		1	1	1	1.62
Intravenous administration sets	100		1	1	1	2.10
Surveillance						

Personnel Time Required per Case:

Visits or Inpatient Time Required per Case: 2 inpatient days; 85 outpatient visits

Source:

Intervention 154: Breast cancer treatment: Stage 3

Definition: modified mastectomy followed by adjuvant chemotherapy– and radiotherapy._ Eligible patients receive tamoxifen.

Target Population: Women with breast cancer

Population in Need: 57.97 % of women with breast cancer are assumed to be in Stage 3 in Regions D and E, which corresponds to developing country prevalence rates.

Stage	Prevalence for Regions A, B and C	Prevalence for Regions D and E
Stage 1	49.00%	9.44%
Stage 2	37.44%	14.17%
Stage 3	8.61%	57.97%
Stage 4	4.95%	18.42%

Possible Delivery Channels:

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Note	Number of units	Times per day	No. of days	Price
Mammogram						
X-ray film	100		4	1	1	$.64
X-ray film chemistry	100		1	1	1	$0.064
Complete blood count/haemogram						
Syringe, needle and swab	100		1	1	1	.08
Complete blood count/haemogram Reagents and control	100		1	1	1	2.52
Blood collecting tube, 5 ml	100		1	1	1	.24
Total bilirubin						
Diazortized Re-agent	100		1	1	1	.41
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Alkaline phosphatase						
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Re-agents required for alkaline phosphatase	100		1	1	1	10.96
Pipettes	100		1	1	1	.04
Buffer solutions	100		1	1	1	.20
Fine needle aspiration						
Aspirating needles	50		1	1	1	22.40
Aspirating syringe	50		1	1	1	22.42
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
Biopsy						
Scalpel blade, disposable	50		1	1	1	.16
Biopsy needle	50		1	1	1	22.41
Saline solution, 9%, 20 ml	50		1	1	1	.09
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
ECG if >60						

Electrodes, Electrocardiographic	50		12	1	1	.09
Gel, Electrode	50		1	1	1	.27
Paper, Recording, ECG	50		1	1	1	.03
Bone scan						
X-ray film	25		4	1	1	$.64
Butylscopolamine	25	one ampoule of 1ml, 20mg	1	1	1	$0.09
Liver ultrasound						
X-ray film	25		3	1	1	$.64
Syringe, needle and swab	25		2	1	1	.08
Developer chemicals	25		5	1	1	.43
Fixing chemicals	25		5	1	1	.43
Lumpectomy						
Scalpel blade, disposable	100		5	1	1	.16
Sponges	100		25	1	1	.04
Sutures	100		8	1	1	.66
Wound drainage kit	100		2	1	1	26.55
Radiotherapy						
X-ray film	100		3	1	1	$.64
(neo) adjuvant chemotherapy						
Doxorubicin, 50 mg vial	100	Four 21 day cycles, 60 mg/m2	2	1	4	$19.40
Doxorubicin, 10 mg vial	100	Four 21 day cycles, 60 mg/m2	1	1	4	$6.24
Cyclophosphamide, 1 g	100	Four 21 day cycles, 2 vials of 1g, 1 of 500 mg	1	1	4	6.39
Cyclophosphamide, 500 mg	100		1	1	4	9.49
Dexamethasone, 4 mg per ampoule	100		1	1	4	.15
Tamoxifen, 20 mg tablet	50	For hormone receptor (ER) positive patients	1	1	365	.13
Cannulae	100		1	1	1	1.62
Intravenous administration sets	100		1	1	1	2.10

Blades, Scalpel, Disposable, No 15	15558	1	{Disposable}	Critical		Disposable
Blades, Scalpel, Disposable, No 23	15558	4	{Disposable}	Critical		Disposable
Forms, Medical and Patient, Pathology	15654	1	{Disposable}	Critical		Disposable

Forms, Medical and Patient, Theatre Reports	15654	1	{Disposable}	Critical		Disposable
Labels, Patient, Specimen	80073	4	{Disposable}	Critical		Disposable
Sponges, X-ray Detectable, Dissecting, Medium (Peanut)	13705	5	{Disposable}	Critical		Disposable
Sponges, X-ray Detectable, Gauze	13705	5	{Disposable}	Critical		Disposable
Sponges, X-ray Detectable, Mopping (Tissue)	13705	10	{Disposable}	Critical		Disposable
Sponges, X-ray Detectable, Packing	13705	5	{Disposable}	Critical		Disposable
Sutures, Nylon, Gauge 2-0, Needle, Large, Cutting	13905	2	{Disposable}	Critical		Disposable
Sutures, Polyglactin, Gauge 2-0, Needle, Medium, Cutting	17471	1	{Disposable}	Critical		Disposable
Sutures, Polyglactin, Gauge 2-0, Ties	17471	1	{Disposable}	Critical		Disposable
Sutures, Polyglactin, Gauge 3-0, Ties	17471	2	{Disposable}	Critical		Disposable
Sutures, Polyglyconate, Gauge 3-0, Needle, Medium, Cutting	17246	2	{Disposable}	Critical		Disposable
Wound Drainage Kits, Closed, Suction, Size 6 mm	16521	2	{Disposable}	Critical		Disposable

Personnel Time Required per Case:

Intern, Assistant, Surgeon	1	Critical	90-120 min
Nurse, Theatre, Floor Nurse	1	Critical	90-120 min
Nurse, Theatre Sister	1	Critical	90-120 min
Specialist, Surgeon, General	1	Critical	90-120 min

Visits or Inpatient Time Required per Case:

Intervention 155: Breast cancer treatment: Stage 4

Definition: adjuvant chemotherapy– and radiotherapy (10 Gy) + end of life hospitalisation. Eligible patients receive total mastectomy and / or tamoxifen.

Target Population: Women with breast cancer

Population in Need: 18.42 % of women with breast cancer are assumed to be in Stage 4 in Regions D and E, which corresponds to developing country prevalence rates.

Stage	Prevalence for Regions A, B and C	Prevalence for Regions D and E
Stage 1	49.00%	9.44%
Stage 2	37.44%	14.17%
Stage 3	8.61%	57.97%
Stage 4	4.95%	18.42%

Possible Delivery Channels:

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Note	Number of units	Times per day	No. of days	Price
Mammogram						

X-ray film	100		4	1	1	$.64
X-ray film chemistry	100		1	1	1	$0.064
Complete blood count/haemogram						
Syringe, needle and swab	100		1	1	1	.08
Complete blood count/haemogram Reagents and control	100		1	1	1	2.52
Blood collecting tube, 5 ml	100		1	1	1	.24
Total bilirubin						
Diazortized Re-agent	100		1	1	1	.41
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Alkaline phosphatase						
Syringe, needle and swab	100		1	1	1	.08
Blood collecting tube, 5 ml	100		1	1	1	.24
Re-agents required for alkaline phosphatase	100		1	1	1	10.96
Pipettes	100		1	1	1	.04
Buffer solutions	100		1	1	1	.20
Fine needle aspiration						
Aspirating needles	50		1	1	1	22.40
Aspirating syringe	50		1	1	1	22.42
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
Biopsy						
Scalpel blade, disposable	50		1	1	1	.16
Biopsy needle	50		1	1	1	22.41
Saline solution, 9%, 20 ml	50		1	1	1	.09
Syringe, needle and swab	50		2	1	1	.08
Specimen containers	50		1	1	1	.065
Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	50		1	1	1	.34
ECG if >60						
Electrodes, Electrocardiographic	50		12	1	1	.09
Gel, Electrode	50		1	1	1	.27
Paper, Recording, ECG	50		1	1	1	.03
Bone scan						
X-ray film	25		4	1	1	$.64
Butylscopolamine	25	one ampoule of 1ml, 20mg	1	1	1	$0.09
Liver ultrasound						
X-ray film	25		3	1	1	$.64
Syringe, needle and swab	25		2	1	1	.08

Developer chemicals	25		5	1	1	.43
Fixing chemicals	25		5	1	1	.43
Radiotherapy						
X-ray film	100		3	1	1	$.64
(neo) adjuvant chemotherapy						
Doxorubicin, 50 mg vial	100	Four 21 day cycles, 60 mg/m2	2	1	4	$19.40
Doxorubicin, 10 mg vial	100	Four 21 day cycles, 60 mg/m2	1	1	4	$6.24
Cyclophosphamide, 1 g	100	Four 21 day cycles, 2 vials of 1g, 1 of 500 mg	1	1	4	6.39
Cyclophosphamide, 500 mg	100		1	1	4	9.49
Dexamethasone, 4 mg per ampoule	100		1	1	4	.15
Tamoxifen, 20 mg tablet	50	For hormone receptor (ER) positive patients	1	1	365	.13
Cannulae	100		1	1	1	1.62
Intravenous administration sets	100		1	1	1	2.10

Personnel Time Required per Case:

Visits or Inpatient Time Required per Case: 2 inpatient days; 85 outpatient days

Source: Martijn Groot, Martijn, and Baltussen, Rob. 2012. Generalized cost effectiveness analysis of breast cancer

Intervention 156: Cervical cancer treatment

This section will be filled in by December 31, 2013

Definition:

Target Population:

Population in Need:

Possible Delivery Channels:

Drugs and Supplies required Per Client:

Personnel Time Required per Case:

Visits or Inpatient Time Required per Case:

Intervention 157: Detection and control of asthma

Definition: Detection and control of asthma.

Target Population: Total Population

Population in Need: Prevalence per 100 by region:

West Africa	3.05
East and Southern Africa	4.04
Latin America and Caribbean	5.41
Asia	2.87
North Africa Middle East	2.60
Europe	1.82
Median	2.96

Possible Delivery Channels: 100% clinic

Drugs and Supplies required Per Client:

Name (generic)	*% use*	Number of units	Times per day	No. of days	Price	Notes
Beclometazone inhaler (250 mcg/dose)	*100%*	1	1	180	$0.017	Method of use is inhaler. Cost is 3.40 per inhaler (MSH) and includes 200 doses.
Salbutamol inhaler (100 mcg/dose)	100%	1	1	180	$0.0108	1 inhaler=200 doses. Median MSH cost is .0108 per dose

Personnel Time Required per Case: 1 visit per year with a doctor, 15 minutes

Visits or Inpatient Time Required per Case: 1 outpatient visit

Source: WHO. 2012. NCD Costing Tool
MSH Drug Price Indicator Guide 2011

Intervention 158: Average annual emergency care needs

Definition: Prehospital care, including the care provided at the scene of an injury or acute condition until the patient arrives at a facility that can treat the condition.

Target Population: Total population

Population in Need: 100%

Possible Delivery Channels: 100% outreach

Drugs and Supplies required Per Client:
Costs of Using Trained Lay First Responders Together With Paramedics, per million population

Region	Low	Best	High
East Asia and the Pacific	27,539	48,050	75,232
Europe and Central Asia	30,209	52,339	79,605
Latin America and the Caribbean	32,777	74,589	110,453
Middle East and North Africa	33,050	104,585	261,935
South Asia	27,183	45,637	116,456

Sub-Saharan Africa	30,765	52,339	115,171
Unweighted average	30,254	62,923	126,475

Source: Olive C. Kobusingye et al. 2006. "Emergency Medical Services" in *Disease Control Priorities in Developing Countries*, 2nd ed., ed. D.T. Jamison et al. Tables 68.3 and 68.4.

Cost per client, based on the unweighted average: $0.06

Personnel Time Required per Case:

Above cost relies on trained volunteers.

Visits or Inpatient Time Required per Case:

Would be associated with the client's particular condition and would be counted under that intervention.