

Supplemental Table 1: IRS and ITN cost categories

| Category | Components | Notes |
|---|--|---|
| IRS | | |
| Spray operations | Planning and logistics assessment activities | |
| | Environmental compliance | Includes soak pit construction, waste storage, and waste disposal |
| | Training of spray operators | |
| | Information, education, and communication (IEC) and community mobilization | |
| | Warehousing | |
| | Short-term labor | Includes only seasonal labor directly tied to the spraying itself (e.g. spray operators, IEC mobilizers, field supervisors, and data entry clerks) |
| | Transportation | Includes only transportation directly tied to the spraying itself (i.e. transporting spray operators between villages) |
| | Other spray costs | Includes medical costs (pregnancy tests for spray operators, first aid), mop-up operations, post-spray meetings, and monitoring and evaluation activities |
| Spray operations commodities | Insecticide | |
| | Spray equipment and equipment repair kits | |
| | Personal protective equipment (PPE) | |
| | Shipping | |
| Local administration | Office leases, utilities, and maintenance | |
| | Office furniture, equipment, and supplies | |
| | Communication | |
| | Travel and transportation | Includes all transportation not directly tied to spray operations |
| | Local labor | Includes all long-term staff based in Tanzania employed by RTI International, as distinct from short-term staff hired only for spray operations |
| | Other local administration costs | |
| In-kind contributions | Government warehouse space | |
| | Government office space | |
| | Government vehicles | |
| | Fuel for government vehicles | |
| | Government labor costs | |
| | Water usage at households | Used to hydrate insecticide sachets during spray operations |
| Short-term technical assistance; US and Nairobi costs | U.S.- and Nairobi-based support services | Not included in analysis |
| ITNs | | |
| Net distribution operations | Planning and logistics assessment activities | |

| | | |
|------------------------------|---|--|
| | Training distributors | |
| | IEC and community mobilization | |
| | Warehousing | Includes storage of nets |
| | Short-term labor | Includes only labor tied directly to the distribution of nets; if net distributors were volunteers, includes an economic valuation of their time |
| | Transportation | Includes only transportation directly tied to the transportation of nets |
| Net distribution commodities | Nets | Long-lasting insecticidal nets come impregnated with insecticide, so costs of insecticides are included in the costs of the net |
| | Voucher production | Only recorded if a voucher-based distribution scheme |
| Local administration | Office leases, utilities, and maintenance | Includes recurrent costs associated with running an office, less labor costs |
| | Office furniture, equipment, and supplies | Includes capital costs associated with running an office |
| | Local labor | Includes all long-term local staff, as distinct from short-term staff or volunteers hired only for net distribution and related activities |

Supplemental Table 2: Cost of illness components

| Category | Components | Notes |
|---------------------|--------------------------|--|
| Household costs | Direct household costs | Includes costs of traveling to clinic, costs of hospitalization, costs of treatment, and user fees |
| | Indirect household costs | Includes caregivers' reported loss of productivity during the entire malaria episode |
| Health system costs | Recurrent costs | Includes drugs and personnel |
| | Capital costs | Includes equipment and building space |
| | Costs of complications | Includes blood transfusions for severe anemia, anti-seizure/anticonvulsant therapies for cerebral malaria, and rehabilitation costs post-discharge for neurological sequelae |

Supplemental Table 3: Descriptions and sources of probability estimates

| Parameter | Baseline | Minimum* | Maximum* | Notes and assumptions |
|--|--|---|---|--|
| Probability of receiving IRS in the dwelling | Mean reported IRS coverage rates from RTI-supported campaigns in Tanzania ^{4,8} | Minimum reported coverage rates ^{4,8} | Maximum reported coverage rates ^{4,8} | Treated as independent from ITN usage rates |
| Probability of using an ITN | Mainland usage rate from most recent Tanzania malaria indicator survey (MIS) ²⁶ | Minimum regional usage rate ²⁶ | Maximum regional usage rate ²⁶ | Treated as independent from IRS coverage rates |
| Probability of infection with malaria parasite, given no | Mainland prevalence of parasitemia from most recent MIS ²⁶ | Minimum prevalence of parasitemia ²⁶ | Maximum prevalence of parasitemia ²⁶ | |

| | | | | |
|---|---|--|---|---|
| intervention | | | | |
| Reduction of prevalence odds from ITNs, IRS, or combination | Point estimate from study of MIS data from 17 sub-Saharan African countries ³² | Lower 95% confidence limit of estimate ³² | Upper 95% confidence limit of estimate ³² | Reflects a parasite rate of $PfPR_{2-10}$ between 5% and 40%; 95% CI completely contains 95% CI of estimate for $PfPR_{2-10}$ between 0% and 5% |
| Probability of developing symptoms if infected | Estimate from follow-up study in Uganda ⁴¹ | Estimate calculated from cross-sectional study in Mozambique ⁴² | Estimate from follow-up study in Dar es Salaam and from personal communications ⁴³ | |
| Probability of seeking formal treatment | Mainland treatment-seeking rate from most recent MIS ²⁶ | Minimum regional treatment-seeking rate ²⁶ | Maximum regional treatment-seeking rate ²⁶ | |
| Probability of treatment failure | Failure rate using artemether-lumefantrine (ALu) in Mainland Tanzania ⁴⁴ | Perfectly effective treatment using ALu ⁴⁵ | Failure rate using monotherapy of amodiaquine ⁴⁵ | Relapse of same malaria infection confirmed by polymerase chain reaction (PCR) test within 28 days of start of treatment; assume relapse will be treated successfully |
| Probability of developing complicated malaria | Point estimate from follow-up study of children aged 1-4 years in Tanzania ⁴⁶ | Lower 95% confidence limit of estimate ⁴⁶ | Upper 95% confidence limit of estimate ⁴⁶ | Assumed to be independent from prior treatment |

* See Table 4 for values

Supplemental Table 4: Input values for best- and worst-case scenario analyses

| Label | Best Case | Worst Case |
|---|-----------|------------|
| Number of IRS rounds required | 1 | 2 |
| Cost of insecticide for IRS per person protected | \$0.34 | \$0.84 |
| Cost of administration/other staff labor (not net distribution) per net distributed | \$0.04 | \$12.65 |
| Cost of IEC for ITNs per net distributed | \$0.04 | \$2.16 |
| Cost of ITN distributors' labor per net distributed | \$0.01 | \$1.95 |
| Number of people covered by a single net | 3 | 1 |
| Unit cost of a net | \$2.50 | \$4.80 |
| Probability of correctly using an ITN | 0.889 | 0.587 |
| Probability of developing malaria given no treatment | 1.000 | 0.117 |
| Probability of parasitemia given no intervention | 0.318 | 0.050 |

Supplemental Table 5: Input values for targeted spraying scenario analysis

| Label | Scenario Value | Notes |
|--|-----------------------|---|
| Number of IRS rounds required | 1 | Assume only target each house once per year |
| Probability of parasitemia, given no intervention | 0.318 | Assume focus only on regions with high prevalence of malaria; maximum regional prevalence |
| Probability receive IRS in dwelling | 0.850 | Reflects TVCSP target for IRS |
| Risk reduction of parasitemia with IRS use | 0.030 | Assume loss of efficacy due to lack of spillover effect; minimum risk reduction |
| Risk reduction of parasitemia with IRS and ITN use | 0.370 | Assume loss of efficacy due to lack of spillover effect; minimum risk reduction |

Supplemental Table 6: Input values for increased pyrethroid resistance scenario analysis

| Label | Scenario Value | Notes |
|--|-----------------------|--|
| Risk reduction of parasitemia with ITN use | 0.030 | Assume loss of ITN efficacy to minimum level |
| Risk reduction of parasitemia with IRS and ITN use | 0.370 | Assume loss of ITN efficacy to minimum level |
| Cost of insecticide for IRS, per person protected | \$0.64 | Reflects 2012 costs of bendiocarb |