Costs of childhood vaccine delivery in Iraq – Supplementary Materials

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Appendix 1. Health facility sampling strategy

To capture regional differences, health facilities providing immunization services were stratified into three sub-national regions: Central and South, North/Kurdistan Region of Iraq (KRI), and Retaken Areas. A sampling frame of all 1719 primary healthcare (PHC) centers and sub-centers was obtained from the Ministry of Health. The number of districts per region and the number of health facilities per district participating in the national immunization program are described in Table 1.

Table A1. Number of health facilities by region and district in Iraq (2018)

Regions	Districts	PHC Centers (Mean per District)	PHC Sub-Centers (Mean per District)	Total PHCs Facilities (Mean per District)
Central & South	71	696 (9.8)	353 (6.1)	**1049 (14.8)**
North/KRI	28	253 (9.0)	73 (3.5)	**326 (11.6)**
Retaken Areas	33	220 (6.9)	124 (4.8)	**344 (10.4)**
Total	**132**	**1,169 (8.9)**	**550 (4.2)**	**1,719 (13.0)**

Health facilities were sampled using the Sample Design Optimizer (SDO) tool following a multistage probabilistic sampling approach stratified by sub-national region[1]. To evaluate the precision of the sample, published estimates of the cost of vaccine delivery in Honduras were used as a proxy for costs in Iraq (Table 2)[2]. Costs from Honduras were converted to 2018 Iraqi dinar and are presented in 2018 US$ using an exchange rate of 1189.24 IQD = 1 USD.

Table A2. Delivery cost estimates used in the proxy outcome estimate for sampling

Distribution Level	Estimated Cost per Dose (2018 US$)	No. of Health Facilities
Health Facilities (no. of doses)[1]		
Huge (≥10,000)	$2.08	657
Large (5000 – 9999)	$3.38	383
Medium (1500 – 4999)	$3.69	521
Small (500 – 1499)	$6.78	127
Tiny (< 500)	$18.67	32
District Level	$8.28[2]	132
Directorate Level	$5.2[2]	19

[1]Size was estimated using the population under-one and the number of doses per fully vaccinated child
[2]Cost per fully vaccinated child

A total of 97 facilities (73 PHC Centers and 24 PHC Sub Centers) were randomly sampled, and distribution stores at the district and directorate level serving the sampled facilities were also included to capture management, cold chain storage and distribution costs at higher levels. The complete list of the sampled PHC Centers and Sub-Centers are described in Table 3.

[1]EPIC Project and ProVac Initiative. Sample Design Optimizer (SDO) Instrument: User Guide. Harvard T.H. Chan School of Public Health; 2019. Available at: http://immunizationeconomics.org/sample-design-optimizer.
[2]Janusz CB, Castañeda-Orjuela C, Molina Aguilera IB, Felix Garcia AG, Mendoza L, Díaz IY, et al. Examining the cost of delivering routine immunization in Honduras. Vaccine. 2015;33 Suppl 1:A53-9.

Table A3. Sampled Primary Health Care Centers and Sub-Centers

Region	Directorate	District	Facility	Estimated Population Under-One	Estimated Doses Delivered
Central & South	BaghdadKarkh	AlDoura	AlJebeihJi	518	6337
Central & South	BaghdadKarkh	AlDoura	BalatAlShouhadaa	1964	24026
Central & South	BaghdadKarkh	AlDoura	HaiAlSehhaAlRaeissi	764	9346
Central & South	BaghdadKarkh	AlDoura	MustafaAlSadr	1270	15536
Central & South	BaghdadKarkh	AlMahmoudieh	AlRasheed	697	7380
Central & South	BaghdadKarkh	AlMahmoudieh	AlRasheedAlNamothaji	876	9275
Central & South	BaghdadKarkh	AlMahmoudieh	AlZunbranieh	180	1906
Central & South	BaghdadKarkh	AlMahmoudieh	TalAlSamar	118	1249
Central & South	Dewanieh	AlDewanieh	AlAmel	271	3090
Central & South	Dewanieh	AlDewanieh	AlDaghara	1944	22167
Central & South	Dewanieh	AlDewanieh	HaiAlHakeem	525	5986
Central & South	Dewanieh	AlDewanieh	HaiAlTaqeya	627	7149
Central & South	Dewanieh	AlHamzah	AlHamzaAlAwal	1029	12577
Central & South	Dewanieh	AlHamzah	AlShanafeiyaAlAwal	901	11012
Central & South	Dewanieh	AlHamzah	AlShanafeiyaAlThani	810	9900
Central & South	Dewanieh	AlHamzah	AlZahraa	271	3312
Central & South	Diyala	Baladrooz	AlFatemeya	144	1674
Central & South	Diyala	Baladrooz	AlShaheedMurtada	1044	12135
Central & South	Diyala	Baladrooz	BeldozarAlAwal	1320	15343
Central & South	Diyala	Baladrooz	Mandali	912	10600
Central & South	Diyala	Khangeen	AlSaadeya	168	1897
Central & South	Diyala	Khangeen	Jabara	472	5329
Central & South	Diyala	Khangeen	QurraTuba	1260	14225
Central & South	Diyala	Khangeen	ShaikhBaba	500	5645
Central & South	Karbulaa	Alhor	AlHassanAlAskari	2369	25042
Central & South	Karbulaa	Alhor	AlYarmouk	1498	15835
Central & South	Karbulaa	Alhor	HaiAlAmeer	436	4609
Central & South	Karbulaa	Alhor	HaiAlAmmel	793	8383
Central & South	Karbulaa	Almarkaz	AinAlTamer	936	9297
Central & South	Karbulaa	Almarkaz	AlNasr	1200	11919
Central & South	Karbulaa	Almarkaz	HaiAlAbbas	1488	14779
Central & South	Karbulaa	Almarkaz	HaiAlHadi	540	5363
Central & South	Mouthanna	Alkhodar	AlDaraji	540	5591
Central & South	Mouthanna	Alkhodar	AlKhader	1272	13170
Central & South	Mouthanna	Alkhodar	AlSadeq	984	10188
Central & South	Mouthanna	Alkhodar	AlThaherah	228	2361
Central & South	Mouthanna	Samawa	AlHaidariyeh	1349	13964
Central & South	Mouthanna	Samawa	AlHussein	536	5549
Central & South	Mouthanna	Samawa	AlSharqi	375	3882
Central & South	Mouthanna	Samawa	GharbiAlSamawa	1465	15165
Central & South	Najaf	Almeshkhab	AlBarra	271	2728

Region	Directorate	District	Facility	Estimated Population Under-One	Estimated Doses Delivered
Central & South	Najaf	Almeshkhab	AlMeshkhab	2964	29842
Central & South	Najaf	Almeshkhab	AlQadeseiya	1560	15706
Central & South	Najaf	Almeshkhab	SouqShalan	552	5558
Central & South	Najaf	Almonatharah	AlHaira	747	7197
Central & South	Najaf	Almonatharah	AlManathera	1300	12525
Central & South	Najaf	Almonatharah	AlMarashdeh	408	3931
Central & South	Najaf	Almonatharah	MahajeerAlGharbeya	184	1773
Central & South	Thiqar	Alshatrah	AlFattaheya	1392	15548
Central & South	Thiqar	Alshatrah	AlKhalsa	1200	13403
Central & South	Thiqar	Alshatrah	AlMaen	96	1072
Central & South	Thiqar	Alshatrah	AlQudsAlSehhi	750	8377
Central & South	Thiqar	Nasriah	AlBathaa	520	5625
Central & South	Thiqar	Nasriah	AlImamAlHassan	709	7669
Central & South	Thiqar	Nasriah	AlRazi	1130	12223
Central & South	Thiqar	Nasriah	AlSadda	240	2596
Central & South	Wasset	Alazeziah	AlAzezzeiah	2902	35183
Central & South	Wasset	Alazeziah	AlNour	765	9275
Central & South	Wasset	Alazeziah	SharhanAlGharbi	234	2837
Central & South	Wasset	Alazeziah	TajEldeen	1092	13239
Central & South	Wasset	Alnomaniah	AlAhrar	1074	12338
Central & South	Wasset	Alnomaniah	AlNouman	360	4136
Central & South	Wasset	Alnomaniah	AlNoumaneiyah	2208	25364
Central & South	Wasset	Alnomaniah	AlSadreen	2304	26467
North/KRI	Erbil	Barazan	Barzan	120	1343
North/KRI	Erbil	Barazan	Bazy	60	671
North/KRI	Erbil	Barazan	Biran	132	1477
North/KRI	Erbil	Barazan	Sardawe	72	806
North/KRI	Erbil	Shaglawah	Hiran	105	1134
North/KRI	Erbil	Shaglawah	Safeen	76	821
North/KRI	Erbil	Shaglawah	ShaheedMlazmKarim	630	6804
North/KRI	Erbil	Shaglawah	Sisawe	30	324
North/KRI	Sulaimanieh	Halabja	Byara	99	1156
North/KRI	Sulaimanieh	Halabja	HalabjayShahid	1679	19613
North/KRI	Sulaimanieh	Halabja	ShahidAliSheea	1675	19567
North/KRI	Sulaimanieh	Halabja	ShahidAmjadHajiGhali	1500	17522
North/KRI	Sulaimanieh	Raniah	Khdran	132	1495
North/KRI	Sulaimanieh	Raniah	RapariniRanya	12	136
North/KRI	Sulaimanieh	Raniah	Shkarta	960	10874
Retaken Areas	Anbar	AlKhaldiah	AlboHusseinAlAli	200	2533
Retaken Areas	Anbar	AlKhaldiah	AlKhaldeya	640	8104
Retaken Areas	Anbar	AlKhaldiah	AlMadeeq	540	6838
Retaken Areas	Anbar	AlKhaldiah	AlShouhada	480	6078
Retaken Areas	Anbar	Heet	AlFurat	895	11442

Region	Directorate	District	Facility	Estimated Population Under-One	Estimated Doses Delivered
Retaken Areas	Anbar	Heet	AlMoalemeen	298	3810
Retaken Areas	Anbar	Heet	AlMuhamdi	273	3490
Retaken Areas	Anbar	Heet	Kbessah	493	6303
Retaken Areas	Karkouk	Aldebes	Khalkhlan	204	2431
Retaken Areas	Karkouk	Aldebes	Malha	110	1311
Retaken Areas	Karkouk	Aldebes	Sarkran	47	560
Retaken Areas	Karkouk	Aldebes	Yayji	353	4206
Retaken Areas	Karkouk	AlHoweigaThani	AlShaheedHamadJassem	704	6019
Retaken Areas	Ninawa	AlAysar	alkhdraa	600	6300
Retaken Areas	Ninawa	AlAysar	alnoor	2580	27089
Retaken Areas	Ninawa	AlAysar	alqudes	648	6804
Retaken Areas	Ninawa	AlAysar	alwahda	1200	12600
Retaken Areas	Ninawa	Senjar	snone	5000	48252

Appendix 2. Methods used for estimating capital and recurrent costs

This section describes the approach used to calculate the cost of vaccine delivery. All costs were collected in Iraqi Dinar (IQD) and converted to USD using an exchange rate of 1189.24 IQD = 1 USD. A bottom-up approach was used when possible to estimate the cost per line item category and immunization activity type. Shared resources, including those shared between the routine immunization program and other health services and across routine immunization activities, were allocated using tracing factors described in Table 4.

Table A4. Tracing factors used to allocate of shared resources

Line Item	Type of Shared Cost	Total to Immunization portion	Immunization portion to activity type
Personnel salaries	Allocation of time to routine immunization and then activity type	% of time spent on immunization services	% of time spent on the activity type
Vehicles and vehicle maintenance	• Vehicles at the facility level for outreach and vaccine collection Vehicles at higher levels for program management and supervision	% used for routine immunizations as reported by the facility	Ratio derived from the number of total km traveled for each activity type
Vehicle fuel and maintenance	Allocated directly to the activity type	100% to routine immunization (assumed no trips were multi-purpose)	100% to the best fit activity

Line Item	Type of Shared Cost	Total to Immunization portion	Immunization portion to activity type
Cold Chain Equipment	Small cold boxes and vaccine carriers for outreach	% used for routine immunization as reported by the facility	% of time spent on outreach activities
Office equipment, printing, and supplies	Office equipment, printing, and supplies used for a variety of activities	% used for routine immunization as reported by the facility	100% allocated to program management
Building overhead	Building value, maintenance, and utilities	% facility space allocated to routine immunization (based on square meters used for routine immunization)	• For health facilities, 100% allocated to facility-based delivery. • For higher levels, 100% allocated to program management
Wastage disposal	Incinerator or wastage removal service	% used for routine immunization	100% allocated to facility-based delivery

Estimation of capital costs

The following approach and assumptions were used to estimate the capital cost of line items for cold chain and office equipment, vehicles and buildings. All capital costs were annualized using equation 1:

$$AF = \frac{(1+r)^{(n-1)}}{r(1+r)^n} \quad (1)$$

where *AF* is the annualization factor, *r* is the discount rate (3% used in this study) and *n* is the useful life-years of the equipment. The annualized cost of equipment was estimated using the equation 2 where *N* is the number of units, *P* is the proportion used for routine immunization, and *R* is the replace price for equipment type *i*. To estimate the cost of each activity, the C_E was multiplied by the percentage used for each activity using the tracing factors described above. Standardized prices and assumptions used for estimating the capital equipment line item and activity cost are described in Tables 5-8.

$$C_E = \sum_i \frac{N_i \times P_i \times R_i}{AF_i} \quad (2)$$

Table A5. Assumptions used in estimating cost of capital equipment

Line Item	Variables	Assumptions
Cold Chain	Equipment price	Replacement prices for cold chain equipment were obtained from UNICEF and the MOH EPI (See Table 6).
	Useful life years	Recommended life years from UNICEF procurement lists
	% used for specific activities	100% of cold chain equipment allocated to facility-based vaccine delivery at the facility-level and allocated to vaccine collection and storage at higher levels.
Vehicles	Vehicle Price	Replacement prices for different vehicle types were obtained from the MOH EPI (See Table 7).

Line Item	Variables	Assumptions
	Useful life years	15 years was used for all vehicles per recommendation from the MOH EPI and country team
	% used for routine immunization	The % reported by the facilities. When information was missing, the region- and level-specific average was used (See Table 8). At the central level, all vehicles were used 80% of the time for routine immunization.
	% used for specific activities	The region and level average % kilometers traveled for each activity was used to estimate the % of vehicles allocated for each activity (See Table 8).
Office Equipment	Equipment price	To account for variability in furniture types at each facility, replacement prices from the facility survey were used. When prices were missing, multiple imputation adjusting for region, facility type, and furniture type was used to estimate the price.
	Useful life years	The life years from the facility survey, ranging from 3 years for electronic equipment to 10 years for furniture.
	% used for routine immunization	The % reported by the facility.
	% used for specific activities	100% of office equipment allocated to program management.

Table A6. Prices, energy consumption, and useful life years used in calculation of cold chain equipment

Equipment Type	Replacement Price (US$)	kWh per Day	Useful Life Years*
Cold Box less than 10 liter	70	0	10
Cold Box less than 20 liter	115	0	10
Cold Box more than 20 liter	115	0	10
Cold Room or Freezer room 10 M3	15,700	1.3	25
Cold Room or Freezer room 20 M3	21,160	1.75	25
Cold Room or Freezer room 40 M3	27,954	2.61	25
Freezer room	27,954	2.61	25
MF 114 Freezer	473	2.24	15
MF 214 Freezer	550	3	15
MF 314 Freezer	642	4.23	15
MK204 Freezer	896	1.89	15
MK304 Freezer	1,036	3.2	15
TCW 1152/CF Freezer	900	2.912	15
Generic Freezer	250	2.912	15
MF 114 Refrigerator	473	2.24	15
MF 144 Refrigerator	840	2.3	15
MK204 Refrigerator	896	1.89	15

Equipment Type	Replacement Price (US$)	kWh per Day	Useful Life Years*
MK304 Refrigerator	1,036	3.2	15
VLS 400 Greenline Refrigerator	1,296	0.67	15
Generic Refrigerator	250	2.015	15
Fridge tag thermometer	29	0	3
Generic thermometer	6	0	3
Ice Packs	0.28	0	5
Vaccine carrier less than 2 liter	12	0	10
Vaccine carrier more or equal to 2 liter	16	0	10
Voltage regulator	55	0	5

*Useful life years standardized based on the median value reported in the facility surveys. Cold room life years was based on feedback from the Iraq EPI

Table A7. Prices used for vehicles by type and make/model

Vehicle Type	Make/Model	Replacement Price (US$)
Ambulance	GMC, Mercedes	30,000
Ambulance	Toyota, Land Cruise, Generic	20,000
Refrigerated Truck	Hyundai, Renault, Iveco	30,000
Refrigerated Truck	Mercedes	40,000
Micro-/Mini-bus	Nissan, Mazda, Generic	20,000
Pickup Truck	Renault, Nissan, Kia, Mitsubishi, Generic	20,000
Pickup Truck	Chevrolet	35,000
Pickup Truck	Deer	18,000
Van/SUV	Kia	16,000
Van/SUV	Ford	30,000
Van/SUV	Mercedes, Hyundai, Nissan	20,000
Car	Toyota, Hyundai, Nissan, Kia, Mitsubishi, Generic	20,000

Table A8. Assumptions on percentage of vehicle time used for immunization services and for each activity

	Central & South			North/KRI			Retaken Areas		
	Facility	***District***	***DOH***	***Facility*[1]**	***District***	***DOH*[2]**	***Facility***	***District***	***DOH***
Average % vehicles used for routine immunization	21%	10%	47%	8%	6%	23%	12%	10%	18%
Average % Kilometers Traveled by Activity									
Supervision	21%	40%	12%	38%	44%	10%	27%	41%	8%
Outreach Vaccine Delivery	36%	0%	0%	0%	0%	0%	23%	0%	0%
Community Mobilization Activities	4%	0%	0%	4%	0%	0%	2%	0%	0%
Vaccine Collection, Distribution, & Storage	19%	19%	77%	20%	11%	81%	21%	19%	85%
Program Management	21%	40%	12%	38%	44%	10%	27%	41%	8%

DOH: Directorate of Health

[1]Facilities in the North/KRI reported no travel for outreach activities

[2]Activity data missing, the average from the other zones used

The annualized cost of buildings was estimated using equation 3 where *F* is the facility size is square meters, *P* is the proportion of area used for routine immunization calculated from the size of the vaccine room and storage space, and *G* is the government price per square meter.

$$C_B = \frac{F_{m^2} \times P_{RI} \times G_{m^2}}{AF} \quad (3)$$

After consultation with the Iraq study team, the price per square meter was estimated by ranking governorates from most expensive to least expensive, and the price ranged from US$ 600/m^2 in rural Ninawa (least expensive) to US$ 1400/m^2 in urban Baghdad (most expensive), see Table 9. For annualization, the useful life years was assumed to be 25 years. For the cost of activities, building costs were allocated to program management at all levels.

Table A9. Government building price per square meter in urban and rural areas[1]

Ranking	Governorate	Price per m^2 in Urban Areas (US$)	Price per m^2 in Rural Areas (US$)
1	Baghdad	1400	824
2	Karbulaa	1376	810
3	Erbil	1353	797
4	Najaf	1329	784
5	Sulaimanieh	1306	771
6	Babel	1282	758
7	Basrah	1259	745

Ranking	Governorate	Price per m² in Urban Areas (US$)	Price per m² in Rural Areas (US$)
8	Duhok	1235	731
9	Diyala	1212	718
10	Karkouk	1188	705
11	Wasset	1165	692
12	Dewanieh	1141	679
13	Sallaheddin	1118	666
14	Mouthanna	1094	653
15	Thiqar	1071	639
16	Missan	1047	626
17	Anbar	1024	613
18	Ninawa	1000	600

[1]Urban assumed to be about 1.7 times expensive compared to rural

Estimation of recurrent costs

The following approach and assumptions were used to estimate the recurrent costs of line items and immunization program activities.

Cold Chain Energy and Maintenance

Recurrent cold chain energy costs included the cost of electricity (C_E) and cost of generators (C_G) using equations 3 and 4. U_{kWh} is the total 24 hour energy usage (kWh), H is the average number of hours used per day for electricity cost and per time used for generator cost, F is the amount of liters of fuel used per hour, P is the price per kilowatt (electricity) or liters (generator), and T is the monthly frequency the generator is used.

$$C_E = U_{kWh} \times H_{day} \times P_{kW} \times 365 \quad (3)$$

$$C_G = H \times F_{L/hr} \times P_L \times T \times 12 \quad (4)$$

The daily cold chain energy usage for each type of equipment is listed in Appendix 2, Table 6. The price per kilowatt ranged from 100-150 IQD, and the price per liter of generator fuel ranged from 100-650 IQD depending on the type of fuel used. All other variables used were from the facility survey.

Vehicle Fuel and Maintenance

Recurrent vehicle costs included the annual cost of fuel and vehicle maintenance. The approach used to estimate vehicle fuel cost depended on the mode of transportation used for vaccine collection, outreach, supervision, training, and routine immunization meeting activities. Equation 5 was used if private or facility vehicles were used where D is the distance traveled in kilometers per trip, F is the average fuel efficiency for the vehicle type (L/km), P is the fuel price per liter, and T is the trip frequency.

$$C_V = D_{km} \times F_{L/km} \times P_L \times T \quad (5)$$

If public transportation or taxi was used, the cost was estimated using the average cost per trip multiplied by the trip frequency. Table 10 describes the vehicle fuel cost assumptions used in equation 5. Vehicle maintenance was estimated using facility reported maintenance expense multiplied by the %

used for routine immunization services, following the same approach used to estimate capital vehicle costs.

Table A10. Vehicle fuel cost assumptions

Description	Assumptions
Average fuel efficiency (L/km)	Fuel efficiency is dependent on the infrastructure and environment at each facility. The facility average for each vehicle type was used.
Fuel price (IQD/L)	Fuel price per liter was standardized by region using the regional median. The median price in the Central & South region was 450 IQD/L, the North/KRI price was 500 IQD/L, and the Recovery Areas price was 600 IQD/L. At the central level, 350 IQD/L was used for refrigerated trucks, and 450 IQD/L was used for other vehicles.
Km traveled per trip	Average roundtrip kilometers traveled per trip for each type of routine immunization activity (vaccine collection, outreach, supervision, routine immunization meetings, and community mobilization).
Trip frequency	Number of annual trips for each activity.
Cost per trip	Roundtrip cost per trip for bus or taxi from the facility survey.

Personnel Salary and Per Diem Costs

Personnel salaries were estimated using equation 6 where S_i is the annual salary for personnel i, B_i is the annual benefits for personnel i, and P_{ij} is the % time spent on j routine immunization activity.

$$C_S = \sum_i \sum_j (S_i + B_i) \times P_{ij} \quad (6)$$

Personnel per diems were estimated using equation 7 where N_j is the number of personnel participating in activity j, D_j is the number of days annually for activity j, and R_j is the daily per diem rate for activity j.

$$C_{PD} = \sum_j N_j \times D_j \times R_j \quad (7)$$

Other Shared Resources

Building utilities (excluding cold chain), office supplies, and printing were estimated using the annual expenditure in 2018 multiplied by the proportion used for routine immunization. The cost of printing and office supplies was negligible at the facility-level and the central level, but included the cost of printing immunization materials at the directorate of health (DOH) level.

Building maintenance was estimated using equation 8 where F is the facility size is square meters, P is the proportion of area used for routine immunization, A is the age of the building, and M is the cost of maintenance per square meter. The maintenance cost per square meter used was US$ 1 per year of age for buildings ≤10 years old, US$ 10 for buildings 11–30 years old, and US$ 15 for buildings >30 years old.

$$C_B = F_{m^2} \times P_{RI} \times A \times M \quad (8)$$

Appendix 3. Vaccine delivery cost at each level by line item (US$)

Line Item	Facility Level	District Level	Directorate Level	Central Level	All Levels
Capital Costs					
Cold Chain	455,481	147,332	83,603	181,654	868,070
Vehicles	55,269	43,860	54,032	22,302	175,463
Buildings	1,996,097	347,161	199,510	175,000	2,717,768
Office Equipment	459,149	98,219	42,458	4,275	604,100
Total	**2,965,995**	**636,572**	**379,604**	**383,231**	**4,365,401**
Recurrent Costs					
Personnel Salaries[1]	80,180,113	6,506,620	1,373,699	311,808	88,372,240
Personnel Per Diems	158,775	65,815	11,488	49,124	285,202
Training	0	0	0	1,081,133	1,081,133
Community Mobilization Activities[2]	122,477	0	0	0	122,477
Cold Chain Energy & Maintenance[3]	2,020,888	185,439	159,035	111,198	2,476,561
Vehicle Maintenance & Fuel[4]	1,148,100	248,440	24,299	27,820	1,448,659
Building Utilities	86,895	183,950	0	1,155	272,000
Building Maintenance	316,557	36,323	31,960	0	384,839
Wastage Disposal	369,505	38,442	7,045	0	414,991
Printing & Office Supplies[5]	0	26,521	96,405	0	122,926
Total	**84,403,309**	**7,291,550**	**1,703,930**	**1,582,238**	**94,981,028**
Total Costs					
Personnel	80,338,888	6,572,435	1,385,187	360,932	88,657,442
Community & Training Activities	122,477	0	0	1,081,133	1,203,610
Cold Chain	2,476,369	332,772	242,638	292,852	3,344,631
Vehicles	1,203,369	292,300	78,331	50,123	1,624,122
Buildings	2,399,548	567,433	231,470	176,155	3,374,607
Wastage Disposal	369,505	38,442	7,045	0	414,991
Office Equipment, Supplies, & Printing	459,149	124,740	138,863	4,275	727,026
TOTAL	**87,369,304**	**7,928,121**	**2,083,534**	**1,965,469**	**99,346,429**

[1]Cost for personnel time spent at trainings and for cold chain maintenance are included in the Personnel Salaries.

[2]Community mobilization included vehicle maintenance and fuel, printing materials and personnel per diems. Annual salaries for personnel time are included in Personnel Salaries

[3]Cold chain maintenance estimated as 5% of the capital costs for cold chain equipment at the national level.

[4]Excluding vehicle maintenance and fuel for community mobilization activities and trainings

[5]Assumed $0 for printing at facility, district, and national levels. Cost of printing immunization materials included at the Directorate store level.