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ESSENTIAL FEATURES

**Integrated
Disease
Surveillance
and Response
(IDSR):**

**Mkakati wa
Ufuatiliaji na
Udhibiti wa
Magonjwa ya
Mlipuko (IDSR)**

**Usimamizi
wa Utendaji
wa Udhibiti
Salama wa Taka
Zitokanazo na
Huduma za Afya:
Uwezo wa Vituo
vya Kutolea
Huduma ya Afya
Tanzania Bara**

Healthcare Waste Management Performance: **The Capacity of Healthcare Facilities in Tanzania Mainland**

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Integrated Disease Surveillance and Response (IDSR): Cumulative report for six months, July – December 2019 (WHO weeks 27-52)

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SUMMARY

The Ministry of Health, Community Development, Gender, Elderly and Children continued to carry out surveillance of reportable diseases and conditions. This paper reports the cumulative IDSR data for a period of 6 months from July to December 2019, which were weeks 27-52 of World Health Organization (WHO). Data were analyzed to assess the national and regional performances in terms of timeliness and completeness reporting as well as determining the cumulative number of cases and deaths, and distribution by age, sex, month and region. Cases of dengue were excluded as these were separately reported in the second issue. All 26 regions of Tanzania Mainland submitted their weekly reports to the national level with the overall average performance of 61.0% and 71.4% for timeliness and completeness respectively. Overall, the average performances during the reporting period were below the national set target of $\geq 80\%$ for both timeliness and completeness. There was no week where the timeliness score met the set national target, however for completeness the target was met at 44th, 45th, 46th, 47th, 48th, 51st and 52nd weeks. Only two regions, met the overall timeliness national target for timeliness ($\geq 80\%$). These were Arusha (84.6%) and Kilimanjaro (82.0%). On the other hand, eleven (11) regions, namely Arusha, Dodoma, Geita, Kilimanjaro, Manyara, Mtwara, Mwanza, Ruvuma, Shinyanga, Songwe and Tanga had health facilities that met the national target of $\geq 80\%$ on completeness of reporting.

Cumulatively, a total of 14,086 cases and 16 deaths were reported for all IDSR immediately reportable diseases and conditions. The most commonly reported condition was “animal bites”, which accounted for 12,833 (91.1%) of all cases and was reported from all the 26 regions of the country, with 1,258 (9.8%) of the cases being reported from Arusha region only. Overall, there were more cases 10,903 (82.5%) of 13,223 in the population aged 5 years and above. Furthermore, between the months of July and August, a total of 52 cases of aflatoxicosis were reported from Dodoma region.

Of the 16 reported deaths, 6 (37.5%) and 5 (31.3%) were caused by “animal bites” and rabies respectively. The condition with highest case fatality rate was rabies (62.5%), whereby 5 deaths occurred among the 8 cases.

In conclusion, the average performance of timeliness and completeness of reporting did not meet the set national standard of $\geq 80\%$, percentage despite the fact that there were some months whereby some regions met the set national standards.

Taking into account that all regions are electronically reporting there is a need for the Government to continue improving the data capturing system to allow for early detection and immediate response to a disease outbreak. Cases of “animal bites” remained high, which calls for an immediate Government’s intervention. The high Case fatality rate of rabies calls for an urgent need of implementing mass dog vaccination as part of the Government’s efforts in implementing the One Health Strategic Plan 2015-2020.

BACKGROUND

In Tanzania surveillance for reportable diseases and conditions under the Integrated Disease Surveillances and Response (IDSR) mechanism are electronically collected, and published weekly and monthly by the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC). It is known that IDSR is a strategy for multi-disease surveillance of selected priority diseases or conditions. It links the community, health facility, district and national levels, for providing immediate information for helping public health managers and decision-makers improve detection and response to the leading causes of illness, death, and disability in African countries. The present paper reports on cumulative IDSR data for a period of six months from July to December 2019, that corresponds to WHO weeks 27 to 52. Data were analyzed to assess the national and regional performances in terms of timeliness and completeness of reporting as well as determining the cumulative number of cases and deaths, and distribution by age, sex, month and region. Cases of dengue were excluded as these were separately reported in the second issue of the bulletin.

ANALYSIS OUTCOME

HEALTH FACILITY PERFORMANCE

All 26 regions from Tanzania Mainland submitted weekly reports of selected priority reportable conditions to the national level. The overall

performance for timeliness and completeness for July to December 2019 was 61.0% and 71.4% respectively. The month of November had the highest scores for both timeliness (76.0%) and completeness (78.2%), but still these were below the set national standards of $\geq 80\%$. (Table 1)

Table 1: Average Timeliness and Completeness of Health Facility Reporting by Month, July – December 2019

Months	% of Timeliness	% of Completeness
July	44.9	67.2
August	58.4	72.2
September	55.5	65.0
October	65.0	71.8
November	76.0	78.2
December	65.8	73.7
Overall Performance	61.0	71.4

As presented in Figure 1, the national target for timeliness of $\geq 80\%$ was not met in all weeks (27- 52) and it was worse in week 27. Similarly for completeness, the target was met at in 44, 45, 46, 47, 48, 51 and 52 weeks.

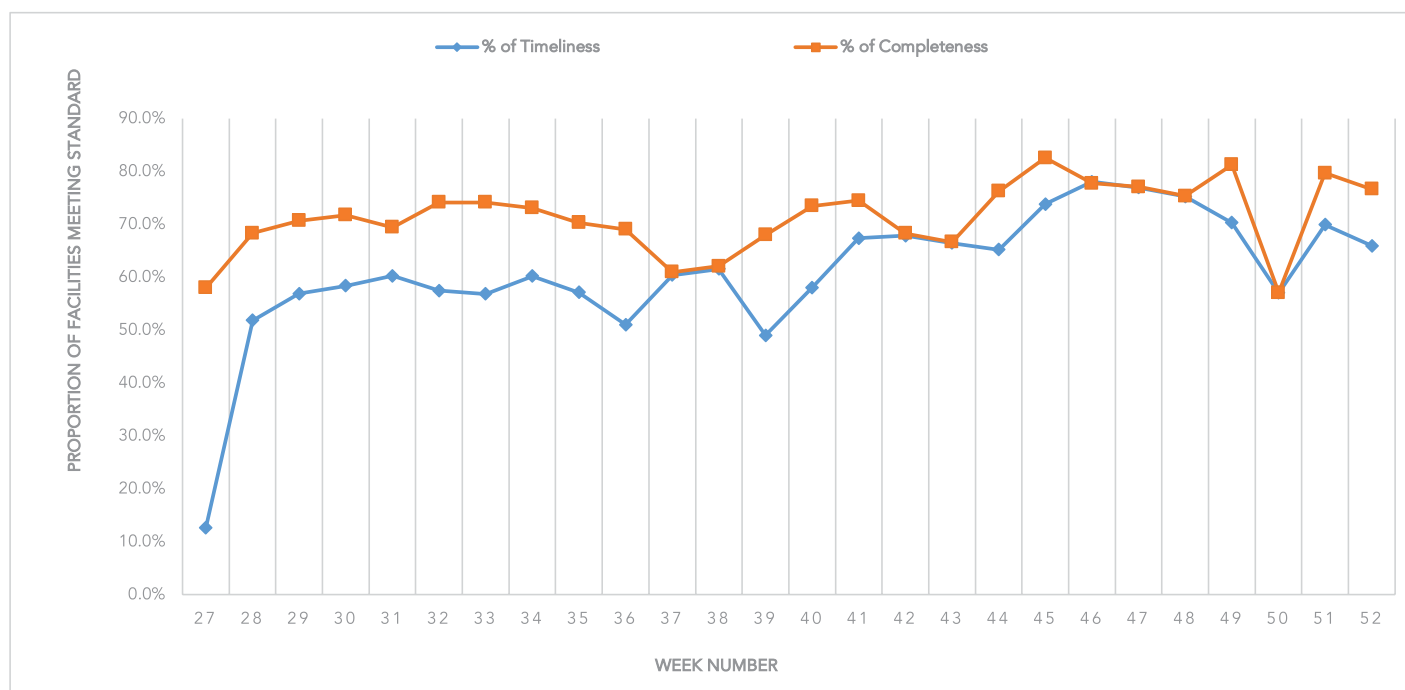


Figure 1: Timeliness and Completeness of Health Facilities reporting by week, July – December 2019 (week 27 – 52)

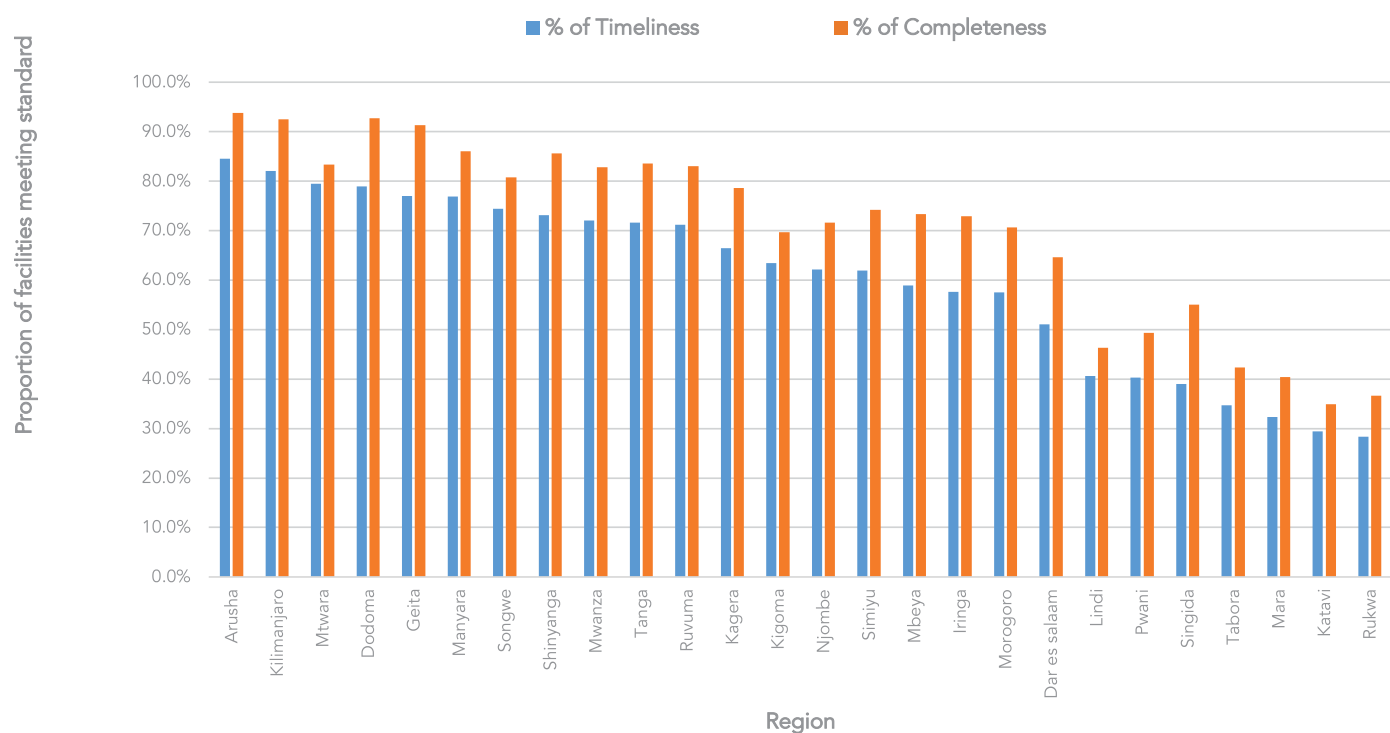


Figure 2: Timeliness and Completeness of Health Facility Reporting from the 26 regions, July – December 2019

The overall timeliness and completeness of reporting by health facilities from all the 26 regions are presented in Figure 2. Only two regions, namely Arusha (84.6%) and Kilimanjaro (82.0%) had their

overall timeliness reporting meeting the national target of $\geq 80\%$. Also, health facilities from eleven (11) regions reporting for completeness met the national target of $\geq 80\%$.

Table 2: Proportions of Health Facilities Timeliness and Completeness Reporting, by month by Region and months, July-December 2019

S/N	Region	July		August		September		October		November		December		Overall	
		Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)	Timeliness (%)	Completeness (%)
1	Arusha	64.3	89.0	84.3	94.2	81.4	92.4	92.1	97.4	95.9	96.4	87.5	92.6	84.6	93.8
2	Dar es salaam	44.4	72.7	53.0	70.2	47.0	56.7	52.4	61.7	58.2	62.7	50.4	63.2	51.0	64.6
3	Dodoma	52.3	83.8	80.0	95.3	79.9	92.5	87.2	95.0	94.4	96.0	77.2	92.5	78.9	92.7
4	Geita	54.1	85.1	81.2	95.7	73.8	90.1	74.4	86.1	95.3	97.8	82.8	93.5	77.0	91.3
5	Iringa	45.0	74.5	48.4	68.8	33.3	46.5	64.2	76.2	84.1	87.6	71.6	83.9	57.6	72.9
6	Kagera	48.9	73.6	61.6	79.1	45.3	57.9	78.1	86.2	93.0	94.8	69.8	78.2	66.4	78.6
7	Katavi	23.9	35.8	25.3	35.8	13.3	17.5	30.8	32.3	43.1	44.4	40.4	44.3	29.4	34.9
8	Kigoma	37.3	51.4	58.2	67.5	56.4	61.9	65.6	68.5	80.4	83.1	83.7	86.3	63.5	69.6
9	Kilimanjaro	63.2	90.1	87.1	96.2	83.7	93.9	88.6	94.1	90.7	93.2	75.8	85.9	82.0	92.4
10	Lindi	40.3	52.7	41.6	49.0	32.3	36.0	34.6	37.5	54.4	56.5	41.8	47.7	40.6	46.3
11	Manyara	49.1	72.9	67.7	80.5	72.9	80.8	82.8	90.0	98.4	98.6	91.5	94.0	76.9	86.1
12	Mara	28.1	46.3	29.2	40.6	17.7	23.2	28.1	32.5	51.8	54.8	41.0	47.1	32.3	40.4
13	Mbeya	49.5	80.4	62.5	79.9	47.3	60.5	57.9	67.4	73.3	77.6	62.0	74.0	58.9	73.3
14	Morogoro	35.7	59.6	43.9	62.7	46.5	57.1	60.0	71.7	84.7	86.6	77.3	87.8	57.6	70.6
15	Mtwara	61.4	68.2	86.3	89.1	82.7	88.1	77.8	82.6	84.1	85.0	83.4	85.9	79.5	83.4
16	Mwanza	51.9	81.2	73.3	84.4	69.1	76.4	85.7	90.3	81.9	84.8	66.6	77.6	72.1	82.8
17	Njombe	41.6	60.9	53.2	65.3	52.7	62.7	70.9	79.1	77.8	79.0	76.5	82.3	62.1	71.6
18	Pwani	30.6	49.8	39.1	51.5	38.4	44.9	44.7	50.7	48.9	51.6	39.2	46.5	40.3	49.3
19	Rukwa	20.1	33.9	28.2	41.2	26.9	35.7	33.7	39.0	37.4	39.0	22.8	29.3	28.4	36.6
20	Ruvuma	52.3	74.4	67.2	83.9	67.0	79.0	68.8	81.4	89.1	91.5	84.4	88.4	71.2	83.1
21	Shinyanga	52.7	82.1	70.8	90.3	80.1	91.9	83.3	88.5	90.9	92.9	59.2	66.0	73.1	85.6
22	Simiyu	23.9	39.8	33.0	55.2	59.9	78.5	86.7	92.3	90.8	92.4	78.7	87.2	62.0	74.2
23	Singida	40.3	67.8	43.1	65.7	31.7	46.4	36.2	47.9	42.2	45.7	39.9	56.2	39.0	55.1
24	Songwe	53.4	68.6	68.1	78.8	70.5	75.5	82.7	84.5	88.7	89.6	82.6	87.3	74.4	80.8
25	Tabora	39.1	56.0	34.5	47.1	39.4	43.4	33.4	36.8	37.1	39.8	25.3	31.2	34.7	42.3
26	Tanga	50.5	78.7	71.0	86.7	68.0	78.7	74.6	82.3	88.8	90.6	76.3	84.2	71.6	83.6
Grand Total		44.9	67.2	58.4	72.2	55.5	65.0	65.0	71.8	76.0	78.2	65.8	73.7	61.0	71.4

Table 2 presents the proportion of health facilities reporting per region per month. Timeliness in the month of July did not meet the national standard target of $\geq 80.0\%$. Arusha and Kilimanjaro regions had their timeliness scores in all months meeting the national standard target of \geq

80.0% except for the month of July. The highest score was 98.4%, which was recorded in November from Manyara region. However, Katavi region had a very low reporting score of 13.3% in the month of September, and had an overall performance of 29.4%. On the other hand the health facilities

reporting completeness was relatively high in most regions, with 4 regions namely Arusha, Kilimanjaro, Dodoma and Geita having scores meeting the national standard target in all reporting months, the highest being from Manyara region, which scored 98.6% in the month of November.

DISTRIBUTION OF CASES AND DEATHS

A total of 14,086 cases of all reportable diseases and conditions were reported from July to December 2019, among which 12,833 (91.1%) were

cases due to animal bites (Table 3). A total of 863 cases due to Dengue fever were not classified into age and sex, therefore were excluded in the analysis presented in Table 3, leaving 13,223 for the analysis. Overall, most (82.5%) were in the population aged 5 years and above.

During the reporting period, there were a total of 16 deaths, whereby 8 (50.0%) occurred among those aged below 5 years and the other 8 occurred among those aged 5 years and above.

Table 3: Numbers of cases and deaths caused by reportable conditions, July - December 2019, by age and sex

Condition/Disease	Cases/Deaths	Total	Below 5 yrs Male	Below 5 yrs Female	Above 5yrs Males	Above 5yrs Female
Acute Flaccid Paralysis	Cases	31	7	3	14	7
	Deaths	0	0	0	0	0
Aflatoxisis	Cases	52	8	1	21	22
	Deaths	2	0	0	1	1
Animal bite	Cases	12,833	1,159	959	6,726	3,989
	Deaths	6	0	6	0	0
Anthrax	Cases	8	0	0	8	0
	Deaths	0	0	0	0	0
Bloody Diarrhoea	Cases	156	70	41	23	22
	Deaths	0	0	0	0	0
Cholera	Cases	16	2	1	9	4
	Deaths	1	0	0	1	0
Cerebral Spinal Meningitis	Cases	4	2	1	1	0
	Deaths	0	0	0	0	0
**Dengue Fever	Cases	863				
	Deaths	0				
Measles	Cases	111	45	20	33	13
	Deaths	1	0	1	0	0
Plague	Cases	2	0	0	2	0
	Deaths	1	0	0	1	0
Rabies	Cases	8	1	0	7	0
	Deaths	5	1	0	4	0
SARI	Cases	2	0	0	2	0
	Deaths	0	0	0	0	0
Total	Cases	14,086	1,294	1,026	6,846	4,057
	Deaths	16	1	7	7	1

** Cases of dengue were not categorized into age and sex, then were not included in the analysis that involved age and sex.

Table 4: Number of cases and deaths caused by reportable conditions, by month, July – December 2019

Condition/Disease	July		Aug		Sept		Oct		Nov		Dec		Total		CFR %
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
AFP	1	0	1	0	7	0	11	0	6	0	5	0	31	0	-
Aflatoxicosis	49	2	3	0	0	0	0	0	0	0	0	0	52	2	3.8
Animal Bites	2,394	6	1,479	0	653	0	2,959	0	2,727	0	2,621	0	12,833	6	0.1%
Anthrax	0	0	0	0	0	0	4	0	4	0	0	0	8	0	-
Blood Diarrhoea	1	0	21	0	42	0	39	0	34	0	19	0	156	0	-
CSM	0	0	0	0	2	0	0	0	1	0	1	0	4	0	-
Cholera	16	1	0	0	0	0	0	0	0	0	0	0	16	1	6.3
Dengue	732	0	89	0	10	0	1	0	1	0	30	0	863	0	-
Measles	0	0	21	0	31	0	25	1	19	0	15	0	111	1	0.9
Plague	0	0	0	0	0	0	0	0	0	0	2	1	2	1	50.0
Rabies	1	0	2	0	2	2	2	2	0	0	1	1	8	5	62.5
SARI	0	0	2	0	0	0	0	0	0	0	0	0	2	0	-
Total	3,194	9	1,618	0	747	2	3,041	3	2,792	0	2,694	2	14,086	16	-

Table 4 provides the number of cases and deaths caused by immediate reportable conditions in each month during the July through December 2019 period. Most conditions were reported more than once, but Cholera, Plague and Severe Acute Respiratory Illness (SARI) were reported once in the months of July, December and August respectively.

The total cases in a month varied from 747 in September to 3,194 in July. Of the total 16 reported deaths most were caused by animal bites 6 (37.5%) and rabies 5 (31.3%). The condition with the highest case fatality rate was suspected cases of rabies, being 5 (62.5%) out of the 8 persons with suspected rabies.

Table 5: Number of reported cases of illnesses by region, July – December 2019

Region	Acute Flaccid Paralysis	Aflatoxicosis	Animal Bites	Anthrax	Blood Diarrhoea	Cholera	Cerebral Spinal Meningitis	Dengue Fever	Measles	Plague	Rabies	SARI	Total
Arusha	5	0	1,258	4	1	0	0	5	9	0	1	0	1,283
Dar es salaam	0	0	540	0	0	11	0	649	0	0	0	0	1,200
Dodoma	0	52	795	1	0	0	0	0	0	0	0	0	848
Geita	1	0	473	0	0	0	0	0	1	0	2	0	477

Region	Acute Flaccid Paralysis	Aflatoxicosis	Animal Bites	Anthrax	Blood Diarrhoea	Cholera	Cerebral Spinal Meningitis	Dengue Fever	Measles	Plague	Rabies	SARI	Total
Iringa	0	0	509	0	0	0	0	0	2	0	0	0	511
Kagera	0	0	617	0	0	0	0	0	10	0	0	0	627
Katavi	0	0	79	0	0	0	0	0	0	0	0	0	79
Kigoma	0	0	514	1	0	0	0	0	0	0	0	0	515
Kilimanjaro	1	0	913	1	10	0	0	0	1	0	0	0	926
Lindi	0	0	177	0	3	0	0	11	0	0	0	0	191
Manyara	0	0	1,200	1	0	0	0	0	0	2	0	0	1,203
Mara	1	0	234	0	0	0	0	0	2	0	0	0	237
Mbeya	1	0	386	0	0	0	0	0	2	0	0	0	389
Morogoro	0	0	797	0	0	0	2	1	0	0	0	0	800
Mtwara	15	0	57	0	136	0	0	1	75	0	0	0	284
Mwanza	5	0	629	0	0	0	0	0	0	0	0	0	634
Njombe	0	0	340	0	0	0	0	0	1	0	0	0	341
Pwani	0	0	515	0	0	0	0	63	2	0	2	0	582
Rukwa	0	0	277	0	0	0	0	0	0	0	0	0	277
Ruvuma	0	0	874	0	0	0	0	1	0	0	0	0	875
Shinyanga	0	0	224	0	0	0	0	0	0	0	0	0	224
Simiyu	1	0	205	0	0	0	1	0	0	0	0	0	207
Singida	1	0	275	0	0	0	1	1	0	0	0	0	278
Songwe	0	0	132	0	0	0	0	0	4	0	2	2	140
Tabora	0	0	358	0	0	0	0	0	2	0	0	0	360
Tanga	0	0	455	0	6	5	0	131	0	0	1	0	598
Total	31	52	12,833	8	156	16	4	863	111	2	8	2	14,086

During the reporting period, a total of 14,086 cases of reportable conditions were reported. All the 26 regions reported animal bites cases with 1,258 of the 12,833 (9.8%) being reported from Arusha region (Table 5). All 52 cases of Aflatoxicosis were only reported in Dodoma region. This is not surprising since the region had experienced an acute aflatoxicosis outbreak in 2016. Cases of plague and SARI were also reported from Manyara and Songwe regions respectively. Dengue cases were reported from coastal regions with Dar es Salaam having the most cases 649 of 863 (75.2%).

CONCLUSION

The IDSR data that was analyzed for July to December 2019 (WHO week 27-52) showed that the average performance based on timeliness and completeness of reporting did not meet the set national standard of $\geq 80\%$, although individually there were some months and regions when the scores met the set national standards. Taking into account that all regions are now electronically reporting the cases there is a need for the Government to continue improving the data capturing system for early detection and immediate response to an outbreak. The number of cases

of animal bites remained high calling for an immediate Government's intervention. Rabies had the highest case fatality rate of 62.5% showing that there is an urgent need for mass dog vaccination to be implemented as part of the Government's efforts in operationalizing the One Health Strategic Plan 2015-2020.

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Mkakati wa Ufuatiliaji na Udhhibiti wa Magonjwa ya Mlipuko (IDSR): Ripoti ya miezi Sita, Julai-Disemba 2019 (wiki ya 27 hadi 52 ya Shirika la Afya Duniani (WHO))

Muhtasari

Wizara ya Afya, Maendeleo ya Jamii, Jinsia, Wazee na Watoto iliendelea kufanya ufuatiliaji wa magonjwa ya mlipuko yanayotolewa taarifa kwa ajili ya udhibiti wa mapema kabla hayajasambaa na kuleta maafa. Makala hii inatoa taarifa za Mkakati wa Ufuatiliaji na Udhhibiti wa Magonjwa ya Mlipuko (IDSR) kwa kipindi cha miezi 6 kutoka Julai hadi Desemba 2019, ambayo ni wiki ya 27 hadi 52 ya Shirika la Afya Duniani (WHO). Takwimu zilichambuliwa ili kutathmini ufanisi wa utendaji kitaifa na kwa kila mkoa, kufahamu idadi ya matukio ya magonjwa na vifo na jinsi yalivyotokea kulingana na umri, jinsia, mwezi na mkoa.

Mikoa yote 26 ya Tanzania Bara iliwasilisha taarifa katika ngazi ya kitaifa kwa wastani wa utimilifu (timeliness) wa asilimia 61 na ukamilifu (completeness) kwa asilimia 71.3. Kwa ujumla ufanisi wa utendaji wa kuwasilisha taarifa kutoka vituo vya kutolea huduma kwa miezi yote 6 ulikua chini ya lengo la kitaifa la asilimia 80 au zaidi. Vile vile, hakuna wiki ambayo kiwango cha utimilifu kilifikia lengo lililowekwa kitaifa, isipokuwa kwa ukamilifu katika wiki ya 44, 45, 46, 47, 48, 51 na 52 ambapo kiwango kilifikia lengo la kitaifa. Mikoa ya Arusha na Kilimanjaro ndiyo pekee ambayo wastani wa jumla wa utimilifu ulifikia lengo la kitaifa kwa asilimia 84.6 na 82.0. Aidha mikoa 11, ya Arusha, Dodoma, Geita, Kilimanjaro, Manyara, Mtwara, Mwanza, Ruvuma, Shinyanga, Songwe na Tanga ndiyo mikoa ambayo wastani wa jumla wa ukamilifu ulifikia lengo la kitaifa. Ufanisi katika utimilifu wa utoaji taarifa kwa vituo vya kutolea huduma ya afya ulikuwa juu kwa asilimia 98.4 katika mkoa wa Manyara katika mwezi wa Novemba, wakati ukamilifu ulikuwa juu kwa asilimia 98.6 katika mkoa wa Manyara kwa mwezi huo wa Novemba.

Kujumla, idadi ya matukio ya magonjwa 14,086 na vifo 16 viliripotiwa kwa magonjwa na hali zote zinazoripotiwa na IDSR. Tukio la ugonjwa lililoripotiwa kwa wingi zaidi lilikuwa ni kuumwa na wanyama

ambapo yalikuwepo jumla ya matukio 12,833, sawa na asilimia 91.1 ya matukio ya magonjwa yote yaliripotiwa kutoka mikoa yote 26. Mkoa wa Arusha uliripoti matukio ya kuumwa na wanyama kwa wingi zaidi ya mikoa mingine ambapo yalikuwa matukio 1,258, sawa na asilimia 9.8 ya matukio yote ya kuumwa na nyama. Kwa matukio yote ya magonjwa yaliripotiwa, jumla ya matukio 10,903 kati ya 13,223 yaliyo kuwa na taarifa za umri na jinsia, yaani asilimia 82.5, yalikua katika kundi la watu wenye umri wa miaka 5 na zaidi. Kulikuwa na matukio 52 yaliyo sababishwa na sumu kuvu kutoka mkoa wa Dodoma katika mwezi wa Julai na Agosti.

Kati ya vifo 16 vilivyoripotiwa, vingi vilisababishwa na kuumwa na mbwa 6 sawa na asilimia 37.5 na ugonjwa wa kichaa cha mbwa ambao ulichangia matukio 5 ya vifo, au asilimia 31.3. Ugonjwa ambao ulionekana kuwa na kiwango cha juu cha uwezekano wa kuua washukiwa (Case Fatality Rate) ni ugonjwa wa wa kichaa cha mbwa, ambapo wagonjwa 5, sawa na asilimia 62.5 kati ya washukiwa 8 walipoteza maisha.

Kwa kuhitimisha, ufanisi kwa kuangalia wastani wa utimilifu na ukamilifu haukufikia lengo la kitaifa la asilimia 80 au zaidi ($\geq 80\%$) licha ya kwamba kuna baadhi ya mikoa iliweza kufikia lengo la kitaifa. Kutokana na ukweli kwamba kwa sasa mikoa yote inatoa taarifa kwa njia ya kieletroniki kuna haja kwa Serikali kuendelea kuboresha mfumo wa ukusanyaji wa takwimu ili ziwe zinakusanywa kwa wakati, na zinawasilishwa na kuchambuliwa haraka ili kuwezesha lengo la kuzuia kuzuka kwa magonjwa ya mlipuko. Matukio yanayosababishwa na kuumwa na wanyama yameendelea kuwa mengi. Hali hii inahitaji Serikali kuweka mkakati utakao wezesha kudhibiti ili kupunguza kiwango cha matukio. Kichaa cha mbwa kimeonyesha kuwa na kiwango cha juu cha uwezekano wa kuua washukiwa. Hii ni dhahiri kuwa ugonjwa wa kichaa cha mbwa ni hatari na kuna auhitaji wa haraka wa kuchanja mbwa wote ikiwa ni sehemu ya utekelezaji wa Mpango wa Kitafia wa Afya Moja wa 2015-2020.

Healthcare Waste Management Performance: The Capacity of Healthcare Facilities in Tanzania Mainland

Honest Anicetus¹, Josephat Saria², Julius Mbuna³ and Samwel Manyele⁴

ABSTRACT

Background: Healthcare waste management (HCWM) is essential for preventing infections among health workers and protecting public health and the environment. Since 2004, the Ministry of Health, Community Development, Gender, Elderly and Children (MOHCDGEC), in collaboration with stakeholders, has reduced the potential negative impacts of healthcare waste to humans and the environment. Activities including supportive supervision and assessment in regional and district hospitals to understand how HCWM is being implemented and support of acceptable evidence-based HCWM practices and standard operating procedures have been implemented. In 2015, the MOHCDGEC assessed HCWM in five regions: Tanga, Kilimanjaro, Arusha, and Manyara and Singida. These were purposively selected and assessed. The prime objective of the assessment was to identify areas of strengths and weaknesses in waste generation, segregation, collection, transportation, storage and disposal. Facility plans for managing healthcare waste were also evaluated.

Methods: To achieve the primary objective, the study used a checklist with which important aspects of HCWM were assessed and recorded. Waste management practices were directly observed and regional and district hospital management staff members were interviewed face-to-face.

Results: The findings revealed that awareness of HCWM best practices among hospital management team members and health workers was high. However, there are challenges at the facility level that hinder efficient delivery of HCWM services. The average healthcare waste generation rate varied from 0.50 to 1.14 kg/patient/day in healthcare facilities. Out of 27 districts visited, only 11 (40.7%) districts had incinerators. The highest percentage was found in Babati Town Council with 2 (18.2%) incinerators out of 11 healthcare facilities. Majority of the incinerators found were low cost incinerators, which basically are not equipped with sufficient air-inlets. They depend on natural blow of wind to support combustion. This results in incomplete combustion which in turn results into release of dense smoke containing toxic pollutants which poses health risks to the people living and working nearby. Open burning and burying were widely practiced, with a mean of 64.0 (\pm SD 3.2) as compared with burning in burning in a structure. Another method that was popularly used for HCWM in all healthcare facilities visited was the use of placenta pits. The highest percentage was observed in Same district with 98.0% and Moshi municipal council 96.6%. Protocols for segregating health care waste by category were not adhered to in some health facilities within the visited regions.

Conclusion: Healthcare waste remains one of the major challenges for improving quality of service in health facilities in Tanzania. Actions are needed to reduce air pollution. HCWM should be a priority in district health plans to strengthen health quality control. Strengthening communication between hospitals and the Medical Stores Department to ensure smooth flow and supply of standard healthcare waste management equipment is essential. Involvement of the private sector and other stakeholders and establishing regulations for HCWM are all necessary to ensure compliance and environmental and public health protection.

Keywords: Healthcare facility, Healthcare waste management, Quality improvement, incinerator

BACKGROUND

The production of excessive amounts of potentially infectious and hazardous waste materials generated by healthcare service facilities (i.e., clinics, hospitals, pharmacies, laboratories, and other supported healthcare facilities, [HCFs]) has increased every year [1]. Each type of HCW requires its own handling and management process. The inappropriate Healthcare Waste Management (HCWM) practices in HCFs can have direct and indirect effects on hazards to community, staff, and patients that may lead to disease outbreaks such as cholera, dysentery, skin infection, and infectious hepatitis [2].

In Tanzania, the number of HCFs is growing rapidly because of an increasing demand for healthcare. In 2013, Tanzania was estimated to have about 7,200 HCFs [3] countrywide. In 2019, there are more than 8,000 according to Health Facility Report [3]. This increase in HCFs is associated with tremendous increase type of healthcare services, technology change and increase of healthcare facility network attributed by the fast growing population. This implies that HCW must be managed in an appropriate manner in order to protect public health and the environment. Proper management of HCW in Tanzania, as in many other sub-Saharan countries, has been and continues to be essential for the prevention of infections among health workers and patients and for enhancing public health and the protection of the environment. Waste generated in HCF includes sharp materials like needles, soiled dressings, body parts, blood samples, radioactive chemicals, and broken medical devices [4]. Good HCWM in any healthcare unit depends on a trained waste management team, competent and dedicated leadership,

careful planning, adequate financing, underpinning legislation, the use of appropriate techniques for treatment and disposal, and training programs for related personnel, the waste generated as well as a national regularly framework [5, 6]. Safe and reliable methods for waste handling are essential, and hence due emphasis has been placed on segregation, safe collection, storage, treatment and final disposal at the site to minimize health hazards [6].

Poor HCWM potentially exposes waste handlers, healthcare workers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the environment [7]. It is essential that all medical waste materials are segregated at the point of generation, appropriately treated and disposed of safely [8]. Mato and Kaseva [13] in their study carried out in Dar es Salaam, Tanzania and involved 47 hospitals indicated that the total amount of health care waste (HCW) was 0.134 kg/patient/day (0.076 kg/patient/day HCW and 0.058 kg/patient/day non-HCW).

In 2008, the MOHCDGEC circulated National Policy, Guidelines, National Standards and a Monitoring Plan to all Regional Health Management Teams and District/Council Health Management Teams to improve performance and maintain consistency and standards in the implementation of HCWM in the country. To gain an understanding to whether hospitals comply with the national policy guidelines and standards, this study aimed at assessing the compliance of HCFs with National Operating HCWM Standards. The assessment identified strengths and weaknesses in relation to segregation, collection, transportation, storage and disposal in order to promote improvement of HCWM.

METHODS

Study design and area

This was a cross-sectional study conducted in Tanga, Kilimanjaro, Arusha, Manyara and Singida regions, which were purposively selected based on the fact that these regions were the first regions to be involved in a pilot and scaling up of treatment and disposal of healthcare waste facilities from 2004. This was the time when the Ministry started building up healthcare waste management concepts and protocols. The assessment covered all hospitals, health centers, and dispensaries within the selected regions and districts. This Study were carried for a period of two month from October through December, 2015

Data collection

A standardized approach was used during the supervision and assessment across all the regions visited. In particular, the assessment involved use of a checklist whereby important aspects in line with the objectives of the study were assessed and recorded including physical observation. Key informants including Regional Health Management Teams, District/Council Health Management Teams), and Hospital Management Teams from regional and district hospitals were interviewed face-to-face. In each region, the assessment procedures included a courtesy call to the Regional Medical Officer followed by a meeting with facility management before proceeding to facility departments.

Data Analysis

The data from the four regions were aggregated across districts and regions and analyzed. For continuous variables, the arithmetic mean was calculated while for categorical variables, frequencies and percentages were calculated to describe the data for various aspects of the study.

RESULTS AND DISCUSSION

Amount of Healthcare Waste (HCW) Generated

According to WHO [14], the HCW generation depends on numerous factors including type of HCFs, hospital specialization, available waste segregation options, seasonal variation, the number of hospital beds, and proportion of patients treated on a daily basis [1]. The average HCW generation rate was found to be varied from 0.50 to 1.14 kg/patient/day in HCFs visited with Meru 1.2kg/patient/day recording the highest (Fig 1). The amount of waste generated increased as the number of patients increased.

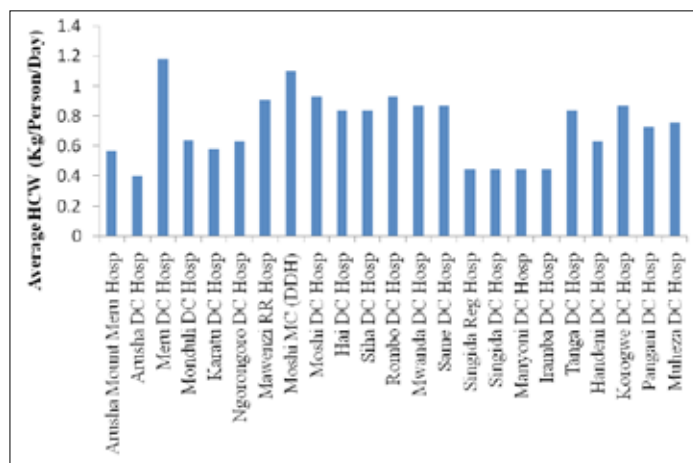


Fig 1: Average Healthcare Waste Generation Rate per district hospital

The results obtained are in line with other results obtained elsewhere [15] in which the total HCW generation rate in different hospitals varied from 0.361 to 0.669 kg/patient/day. This result was compared with the waste generation rates determined earlier in other studies by Komilis et al., [16] who reported the mean unit generation rate of total medical waste in Greece varied from 0.00124 to 0.718 kg/bed/day. The results obtained are much lower than the one determined earlier [17], where the HCW generation rate was 9.61 ± 3.28 kg/day of which (38%) 3.64 ± 1.45 kg/day was general or non-hazardous waste and (62%) 5.97 ± 2.31 kg/day was hazardous. The variation in total HCW generation among hospitals may be ascribed to a variety of reasons like income level of patients, the type of healthcare, and welfare of patients and relatives as well as diversity of departments. It is worth mentioning that it is risky to make comparisons with HCW records from other countries especially developed countries, due to the variability in the definitions and classifications of HCW throughout the world.

Compliance with Healthcare Waste Collection

The popular containers used for HCW collection in Tanzanian hospitals are plastic bags, safety boxes and plastic bins (Fig 2).



Fig 2: Recommended Labeled Waste Containers for Collection of HCW in Healthcare Facilities

To make collection possible, waste storage facilities need to be kept in place. Manyele and Mujuni [9] indicated that to remove medical waste collected at the generation point to the collection point, transportation facilities are important. For the best practice on medical waste collection and segregation, waste is categorized and different categories of waste are placed in labeled containers of different colours. Colour coding and labelling helps health care workers locate containers they need for a specific type of waste [10]. Moreover, waste handlers can put more attention on containers intended to contain sharps waste and minimize accidents. Improper handling of medical waste can bring occupational hazards. The infectious waste produced in the course of healthcare activities carries a higher potential for infection and injury.

Compliance with Healthcare Waste Segregation

Observations during the present study showed that segregation of the HCW into the five defined categories was not implemented satisfactorily. There were poor segregation practices at hospitals and in health centers in comparison with Health Care Facilities (HCFs) in other developing countries, as observed in earlier studies [18]. Poor segregation could be the likeliest explanation for the relatively high proportion of HCW observed in the present study. Lack of separation of infectious and non-infectious wastes at their source increases the percentages of infectious wastes.

Compliance with Healthcare Waste Storage

According to WHO/UNICEF [21], HCW should be separated and segregated right at source by using appropriate bags, tools and containers. The allowed time for HCW storage at the healthcare establishments is a maximum of 48h, and then it should be transported outside of the hospital by using specific tools matching the technical requirements. Most, 78%, of HCFs do not have sheds or storage bays. Haylamicheal, et al., [18], indicated that for storage space of medical wastes, it is supposed to be selected within the HCF surrounding suitable for the to the amount of medical waste generated in the HCF. The storage is recommended to be easily accessible by workers managing waste, not easily accessible to animals, insects and birds, confined from sun, not close to food store and food grounding areas [22]. This was not the case for the visited health facilities where most storage spaces were in open spaces, not under shade, and were exposed to scavengers, animals and insects.

Compliance with Healthcare Waste Disposal

Incineration of waste materials has been the major technique used by healthcare units for disposing large amount of waste materials in many countries. These materials may include biomedical waste including such materials as polyvinyl chloride plastics, papers, and discarded items of equipment. Some waste is highly flammable or even explosive [19]. Basically, the incineration is an engineered process designed to treat HCW by thermal decomposition via thermal oxidation at temperatures between 900 and 1200°C to destroy the organic fraction of the waste [19].

Figure 3 provides the percentage of incinerators existing per district. The highest percentage was found in Babati Town Council with 2 (18.2%) incinerators in 11 HCF. This was followed by Singida Municipal Council, which had 3 incinerators (16.7%) in 18 HCFs. However, it is worth mentioning that out of 27 districts visited, only 11 (40.7%) districts had no incinerators. In those districts with at least one incinerator, 59.3%) of them were not properly functioning or were not equipped with sufficient air-inlets, and so they can endanger the health of the people living and working nearby.

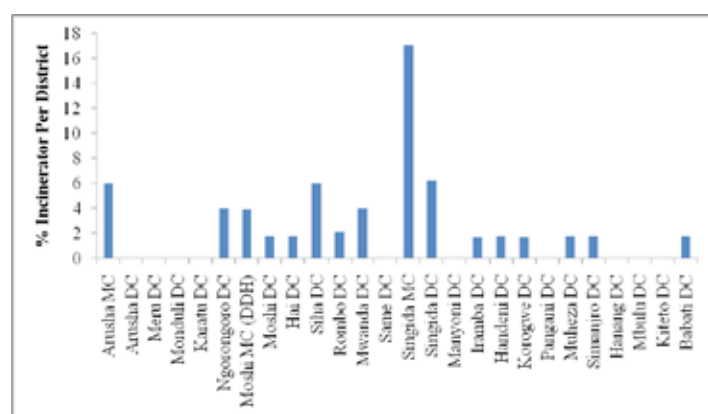


Fig 3: Percentage of Total Incinerators per District

Hossain and his colleagues [20] indicated that it is important to consider selection of the best HCW treatment technology. The choice of the technique must have minimal risk evaluation for waste management facilities, minimal human health impact, and minimal environmental impact, and must be cost-effective and easily implemented. This is with fact that incineration of HCW can result in significant unintentionally produced persistent organic pollutants emissions and many other hazardous chemicals.

According to Matee and Manyele [3], air pollutants resulting from combustion constituents include carbon monoxide, hydrocarbons, unburnt carbon, aldehydes, amines, organic acids, polycyclic organic matter and any other waste constituents or their partly degraded products that escape. Organic pollutants given out as a result of incomplete combustion of waste material are often generated in the primary combustion chamber operating at low temperature. The control of the emission of these organic pollutants can be handled by continued combustion at high temperatures using after burners (also termed secondary combustion chambers), which low combustion single chamber Incinerators lack.

This makes the final disposal method used in the surveyed healthcare facilities to be very poor when compared with other developed countries. This could be due to the use of Low Combustion Single-Chamber Incinerators (Fig. 4) for the treatment of HCW, which is against the Stockholm Convention on persistent organic pollutants since such incinerators release dioxins/furans [18].

In practice as indicated in Fig. 4 few healthcare facilities have incinerators around their compound and mostly double chamber incinerator of either vertical or horizontal or high tech incinerator type (supported with fuel burner to allow efficient combustion of waste materials allowing escape of smoke and other exhaust which eventually are released through incinerator chimney).



Fig 4: Low Cost Double Chamber Incinerator

Apart from incineration, other technique, which is commonly used to all healthcare facilities in disposing of HCW, is burning either by having structure (Fig 5a) and by using open burning/burying method (Fig 5b).



Fig 5a: Burning Structure



Fig 5b: Open Burning and Burying

It was observed that healthcare facilities without incinerator or having a faulty one were burning their waste. Figure 6 shows that majority of the visited healthcare facilities were using open burning and burying method.

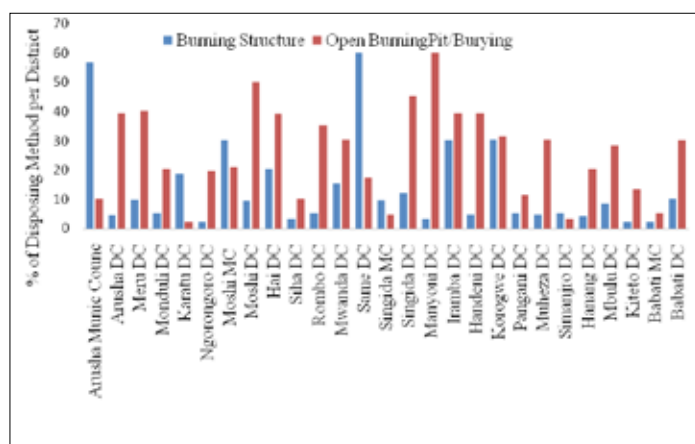


Figure 6: Percentage of HCF using burning HCW disposal methods per district

Most HCFs were using open burning and pit burying technique with a mean of 64.0 ± 3.2 as compared to burning in burning structure mean of 34.5 ± 1.3 . A study done by Wiedinmyer and colleagues [23] estimated that 41% or 970 million tons per year of the total HCW in developing countries are managed by open burning. Much of the open waste burning occurs in dumpsites that have been filled far beyond their capacity.

Open burning of waste releases a variety of toxic pollutants into the air and also can exacerbate soil pollution, water pollution and food contamination [12]. Open waste burning releases significant amounts of greenhouse gases into the atmosphere. Such compounds include Nitrogen oxides, Sulfa dioxides particulate matter and carbon dioxide, which are typically associated with air pollution and can lead to severe cases of respiratory disease [24]. Open burning of HCW is especially associated with the emission of persistent organic pollutants. This includes polycyclic aromatic hydrocarbons, dioxins and furans, some of which are carcinogenic and have been linked to a variety of other diseases [25]

Another method that was popularity used in all healthcare facilities visited was the use of placenta pits. The highest percentage (Fig 7) was observed in Same district council with 98% and Moshi municipal

council 96.6%. This shows that most HDFs have operational placenta pits. In Simanjiro district there was no HCF with placenta pits and very few (2.9%) in Arusha Municipal council.

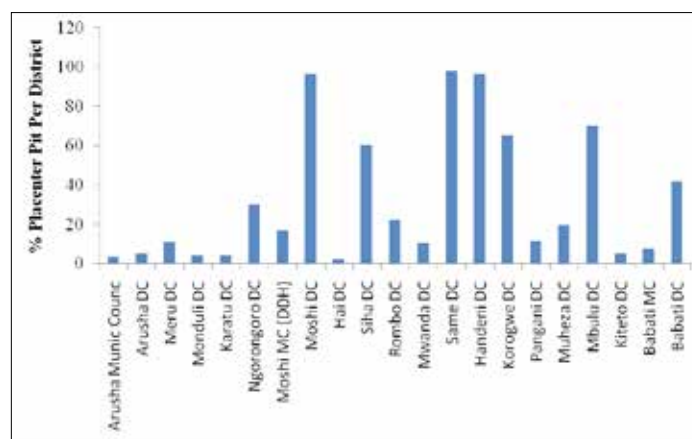


Figure 7: Percentage of HCF in the District with Placenta Pits as methods for HCW management

Placenta pit is a very useful technology because it allows pathological waste to degrade naturally. According to WHO [26], about 90% of the waste is liquid, which will soak away into the ground. The rest will degrade though a complex and variable mixture of biological and chemical processes. These are primarily anaerobic processes though some aerobic decomposition will take place in the upper layers. The waste should not be treated with chemical disinfectants like chlorine before being disposed because these chemicals destroy the microorganisms that are important for biological decomposition.

Overall HCWM Best Practices

Table 1 provides information on overall assessment of HCWM best practices in the visited health facilities across the regions. Only 32% of the health facilities visited had standard waste bins while 4% has bins with liners and 12% has labelled waste containers. Majority of healthcare facilities visited in the regions lacked availability of standard HCWM equipment or the existing ones were very poor. These included waste bin, bin liners, and transportation facilities, thus posing a great challenge for proper management of waste for improving quality of services in health care facilities in the country.

CONCLUSION

Mismanagement of HCW causes health threats to human beings as well as the surroundings by polluting the air, soil and water resources. Healthcare facilities are expected to safeguard the health of the society. However, HCWs, if not appropriate handled, can pose a greater threat than the original diseases. Generally, the visited health facilities lack essential facilities for proper and efficient HCWM including HCWM plans and equipment. The effective management of HCW may require adequate resource allocation for improving the current HCWM system and related technologies for waste treatment and disposal altogether with dissemination of up to date guidelines and standards, regular refresher orientation of workers and training of focal persons, strengthening communication between hospitals and the Medical Stores Department, strengthening of communication between implementers and policy makers as well as involvement of private sector and other stakeholders in the management of such wastes. Further operation and maintenance of HCW treatment facilities is crucial to foster sustainability of the existing facilities.

Table 1 Availability of Standard HCW Equipment by Healthcare Facilities

Region	Hospitals	Standards waste bins exist	Bin liners available	Waste transportation facilities available	Facility Plan for HCWM exist	Waste container labeled
K'njaro	Moshi RR	No	No	No	No	No
	MMH	No	No	No	No	Yes
	MDC	No	No	No	No	No
	Hai DC	No	No	No	No	No
	Siha DC	Yes	Yes	No	No	No
	Rombo DC	No	No	No	No	No
	Mwanga	No	No	No	No	No
	Same DC	No	No	No	No	No
Arusha	Regional	Yes	No	No	No	Yes
	Meru	no	no	no	no	No
	Arusha DC	yes	no	no	no	No
	Monduli	yes	no	no	no	No
	Karatu	no	no	no	no	No
	Ngorongoro	no	no	no	no	No
Manyara	Babati TC	Yes	No	Yes	Yes	No
	Babati DC	No	No	Yes	No	No
	Hanang	No	No	No	No	No
	Mbulu	No	No	No	No	No
	Kiteto	Yes	No	No	No	No
	Simanjiro (HC)	No	No	No	No	No

Region	Hospitals	Standards waste bins exist	Bin liners available	Waste transportation facilities available	Facility Plan for HCWM exist	Waste container labeled
Tanga	Bombo Hospital	Yes	No	Yes	Yes	Yes
	Handeni	No	No	No	No	No
	Korogwe DC	Yes	No	Yes	No	No
	Pangani	No	No	No	No	No
	Muhea	No	No	No	No	No

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MHUISARI

Usimamizi wa Utendaji wa Udhhibiti Salama wa Taka Zitokanazo na Huduma za Afya: Uwezo wa Vituo vya Kutolea Huduma ya Afya Tanzania Bara

Honest Anicetus¹, Josephat Saria², Julius Mbuna³ and Samwel Manyele⁴

UTANGULIZI: Usimamizi wa utendaji wa udhibiti salama wa wa Taka Zitokanazo na Huduma za afya ni muhimu kwa kuzuia maambukizo miongoni mwa wafanyakazi wa afya, wateja na kulinda afya ya umma na mazingira. Tangu mwaka 2004, Wizara ya Afya, Maendeleo ya Jamii, Jinsia, Wazee na Watoto (MOHCDGEC), kwa kushirikiana na wadau, imekua ikitekeleza mikakati mbalimbali ya kupunguza athari mbaya za taka za afya kwa wanadamu na mazingira. Utekelezaji wa Mikakati na Shughuli mbalimbali zikiwa ni pamoja na ufuatiliaji na usimamizi shirikishi wa uangalizi na tathmini katika hospitali za mikoa na Wilaya ili kuelewa jinsi ya kusimamia utendaji wa udhibiti salama wa taka zitokanazo na huduma za afya. na kwa kiasi gani unavyoingwa mkono kwa ushahidi uliodhahiri ambao unakubalika katika utendaji wa usimamizi wa udhibiti salama wa taka zitokanazo na huduma za afya (HCWM) kwa kufuata taratibu na miongozo iliyowekwa kusimamia utendaji kuanzia pale zinapozalishwa mpaka zinapotekelezwa. Mnamo mwaka 2015, Wizara ya Afya, Maendeleo ya Jamii, Jinsia, Wazee na

Watoto ilifanya usimamizi shirikishi na tathmini ya udhibiti wa taka zitokanazo na huduma za afya katika mikoa mitano ambayo ni Tanga, Kilimanjaro, Arusha, Manyara na Singida. Mikoa hii walichaguliwa kwa makusudi na kutathminiwa kwa kuwa ilikuwa imeanza utekelezaji wa majaribio (pilot) tangu mwaka 2004. Kusudi kuu la tathmini hii, ilikuwa kutambua maeneo wanayo yamudu na yenye udhaifu katika uzalishaji wa taka, uchambuzi, ukusanyaji, usafirishaji, uhifadhi na utupaji. Mipango ya kudhibiti/kutekeleza taka zinazozalishwa kutokana na huduma za afya za kila kituo cha kutolea huduma kilichotembelewa pia ilipimwa.

MBINU: Ili kufikia lengo la kuu, utafiti ulitumia orodha ya kuangalia mambo ambayo ni muhimu juu ya usimamizi wa udhibiti wa taka zitokanazo na huduma za afya yalipimwa na kurekodiwa. Tabia za usimamizi wa udhibiti/utekelezaji taka ulifanyika kwa kukagua maeneo moja kwa moja na wafanyakazi wa hospitali za mikoa na wilaya walisailiwa uso kwa uso.

MATOKEO: Matokeo yalionyesha kuwa uelewa wa utendaji

bora juu ya usimamizi wa udhibiti/uteketezaji wa taka zinazozalishwa kutokana na huduma za afya (HCWM) kati ya wanakamati wa kamati za usimamizi wa hospitali na wafanyikazi wa afya ulikuwa juu. Hata hivyo, kuna changamoto katika ngazi ya vituo ya kutolea huduma ambacho kinazuia utoaji bora wa huduma za usimamizi wa udhibiti wa taka zitokanazo na huduma za afya (HCWM). Kiwango cha wastani cha uzalishaji wa taka zitokanazo na huduma za afya kilikuwa kinatofautina kuanzia 0.50 hadi 1.14 kg / mgonjwa / siku katika vituo vya kutolea huduma ya afya. Kati ya wilaya 27 zilizotembelewa, ni wilaya 11 tu sawa na asilimia 40.7 zilizokuwa na incinerators (kiteketezi taka rafiki wa afya na mazingira). Asilimia kubwa zaidi ilipatikana katika Halmashauri ya Mji wa Babati kukiwa ni vituo 2 sawa na asilimia 18.2 kati ya vituo 11 vya kutolea huduma ya afya. Idadi kubwa ya incinerators zilikuwa za bei ya chini ambazo hazina vifaa vya kutosha kuruhusu hewa (inategemea mwelekeo upepo), kusaidia mwako kamili. Hivyo incinerators kufikia mwako usio kamili ambao ulisababisha kutoka kwa moshi mzito ulio na sumu unaosababisha hatari kwa afya ya watu wanaoishi na kufanya kazi karibu kwa sababu ya uchafuzi wa hewa inayotokana na mwako usio kamili wa taka zinazoteketezwa. Kuchoma taka wazi na kuzifukia ndiyo njia ambazo zilikuwa zinatumiwa sana, kwa kiwango cha wastani wa 64.0 (± SD 3.2) ikilinganishwa na kuchoma moto kwa kiteketezi taka (incinerators). Njia nyingine ambayo ilikuwa maarufu kwa usimamizi wa utendaji wa kudhibiti taka zitokanazo na huduma za afya (HCWM) katika vituo vyote vya kutolea huduma za afya zilizotembelewa ilikuwa matumizi ya shimo linalotumika tupa kondo la nyuma la uzazi (pit placenta). Kwa kutumia njia hii ya shimo la kondo la nyuma la uzazi, asilimia kubwa ilikuwa katika wilaya ya Same ikiwa na asilimia 98.0 na halmashauri ya manisipaa ya Moshi ikiwa na asilimia 96.6. Utaratibu wa kutenganisha taka zitokanazo na huduma za afya kwa aina yake, ulionekana kutokizingatiwa katika baadhi ya vituo vya kutolea huduma afya katika mikoa iliyofanyiwa utafiti.

HITIMISHO: Taka zinazozalishwa kutokatana na huduma za afya bado ni moja wapo ya changamoto kubwa katika kuboresha huduma za afya katika vituo vya kutolea huduma ya afya nchini Tanzania. Hatua zinahitajika ili kupunguza uchafuzi wa hewa na kuenea kwa magonjwa. Usimamizi wa utendaji wa udhibiti wa taka zitokanazo na huduma za afya (HCWM) unapaswa kupewa kipaumbele katika mipango ya maendeleo ya afya ya wilaya ili kuimarisha udhibiti wa ubora wa afya. Aidha kunatakiwa kuimarisha mawasiliano kati ya hospitali na Bohari ya Dawa (Medical Stores Department) ili kuhakikisha mtiririko wa upatikanaji na kuwepo utaratibu maalum wa usambazaji wa vifaa vya usimamizi wa utendaji wa udhibiti wa taka zitokanazo na huduma za afya. Pia kunatakiwa kuwepo na ushirikishwaji wa sekta binafsi na wadau wengine na uanzishaji wa kanuni za usimamizi wa utendaji wa udhibiti wa taka zitokanazo na huduma za afya (HCWM), hatua zote hizi ni za muhimu ili kuhakikisha usalama wa mazingira na afya kwa jamii.

Maneno ya muhimu: Kituo cha kutolea huduma ya afya, Usimamizi wa taka zitokanazo na huduma za afya, Uboreshaji wa ubora, incinerator (kiteketezi taka rafiki wa afya na mazingira)

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