

Healthcare workers' readiness to provide immunization services at primary health care units in pastoral and semi-pastoral regions in Ethiopia: Core Group Polio Project implementation areas

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Abstract

Background: Ethiopia has been implementing immunization programs for the past four decades. However, coverage remains low, especially in pastoral and semi-pastoral regions. Among the obstacles to achieving immunization targets is the level of health workers' readiness to provide immunization services, measured in terms of levels of motivation, capacity and involvement.

Objective: To assess the extent of healthcare providers' readiness to provide immunization services at primary healthcare units in pastoral and semi-pastoral areas of Ethiopia.

Methods: A cross-sectional survey was conducted on a sample of 1,283 healthcare providers involved in immunization services in 233 health centers, and 699 health posts in the health center catchment areas. From five CORE Group Polio Project intervention regions in Ethiopia, interviews were held with personnel in each health center – an Extended Program on Immunization focal person, a midwife, and the medical director or head. From each health post, interviews were held with one health extension worker. Data were collected using a self-administered questionnaire facilitated by *woreda* and zonal health and CORE Group staff. The outcome variable of interest, readiness, was measured using three indicator variables – high to very high levels of self-reported motivation and involvement in immunization service provision, and having received at least one immunization-related training in the last two years. In addition to health care workers' background characteristics, where workers were based – in pastoral or semi-pastoral areas – were included as factors for readiness. Data were entered into EpiData and exported to STATA version 12 for analysis. Binary logistic regression was used to identify independent factors associated with readiness, and $p < 0.05$ was used to declare statistical significance.

Results: Among health center respondents, those with a diploma were 2.3 times more likely to be ready compared to those with a first degree. Similarly, nurses and those who claimed higher satisfaction with supportive supervision were 2.1 and 6.2 times more likely to be ready to provide immunization services compared to midwives and those with a medium level of satisfaction, respectively. Among health post staff, being female (AOR=2.2), having more than five years of work experience (AOR=2.2) and having a high level of satisfaction with supportive supervision (AOR=4.5) showed higher readiness levels compared to males, those with less than or equal to two years of service, and those with a medium level of satisfaction, respectively.

Conclusions: To ensure health care workers' readiness to provide immunization services, providing ongoing in-service training and improving supportive supervision, particularly for men in health posts, should be prioritized. [*Ethiop. J. Health Dev.* 2019; 33(Special issue):37-45]

Key words: Primary healthcare unit, readiness, immunization, health workers, pastoral and semi-pastoral, Ethiopia

Introduction

The Expanded Program on Immunization (EPI) was initiated by the WHO in 1974 through a resolution passed at the World Health Assembly (1,2). Immunization programs in resource-poor countries face many challenges, including shortages of vaccines, untrained staff and supervisors, and unreliable power supplies (3).

In Ethiopia, the routine immunization program targets include vaccination of children between 0 and 11 months against 10 vaccine-preventable diseases (VPDs) and pregnant women against tetanus (4,5). However, the coverage in Ethiopia remain less than the set targets (6-9), specifically in pastoral and semi-pastoral hard-to-reach areas (5).

Supportive supervision enhances the capacity of health providers and helps to correct any constraints

encountered in the provision of health services, including immunization. In order to ensure the quality

of services, ongoing in-service training and regular supportive supervision are required (10-13).

A study in Mozambique identified the location of the health facility to be the main cause of inadequacy of health services. Researchers noted that workers in the peripheral health facilities were in general less educated, less experienced, and their knowledge was not at a sufficient level to support effective cold chain (14).

In countries with low health leadership commitment to the health services, immunization programs suffer from a lack of sufficient and/or reliable funds, inadequate human resource capacity and low motivation to address chronic bottlenecks that hinder performance (15). One important factor influencing the successful implementation of system-wide change is initial

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readiness. Readiness is defined as the degree to which those involved are individually and collectively primed, motivated, and technically capable of readiness to provide immunization services (16). The Service Availability and Readiness Assessment (SARA) developed by the WHO is designed to assess health facility service delivery, such as the availability of key human and infrastructure resources, and the readiness of health facilities to provide basic health care interventions (17), but does not focus on the readiness of health workers themselves.

Several studies report on the readiness of health facilities in different aspects of services, but to our knowledge there is no information available on health care providers' readiness to provide immunization services. In this study, therefore, we assessed the readiness of health care workers to provide immunization services at primary health care units (PHCUs)– health centers (HCs) and health posts (HPs) – and identified associated factors for readiness.

Methods

A facility-based cross-sectional survey was conducted in five CORE Group Polio Project (CGPP) intervention regions, namely Benishangul-Gumuz, Gambella, Oromiya, Somali, and Southern Nations, Nationalities and Peoples' (SNNP). The study targeted a total of 1,398 healthcare providers, of which 699 were health professionals from 233 HCs and 699 were health extension workers (HEWs) from 699 satellite HPs, randomly selected from HC catchment areas. A self-administered questionnaire, developed in English and translated into the local languages of Somali, Oromifa and Amharic, was given to HC and HP staff – an Extended Program on Immunization focal person, a midwife and the medical director or head in each HC; and an HEW in each HP. Support letters from the respective zonal and woreda health offices were obtained and verbal consent from respondents was secured prior to the interviews. The data collection process was facilitated by CORE Group staff and *woreda* and zonal project staff. Facilitators received a one-day orientation on the objectives of the study, selection of respondents and questionnaire administration procedures. Data were collected in August 2016.

Outcome variable measurements: The readiness of immunization service providers in this study was measured based on three indicators – motivation,

involvement and training. Respondents' self-reported assessments of their motivation and involvement levels were based on five scales ranging from very high to very low. Respondents who claimed high to very high motivation or involvement were considered as motivated or involved in immunization service provision. With respect to training, providers who received at least one training course related to immunization (EPI) services in the past two years were considered to be trained in EPI. Therefore, based on the definitions of motivation, involvement and training, a healthcare provider was considered to be ready for immunization-related services only if they reported high to very high levels of motivation and involvement, and at least one EPI-related training course they had completed during the past two years.

In addition to socio-demographic characteristics, years of service, basic training, supervision usefulness and location of place of work of respondents were considered as factors associated with the readiness of health care workers to provide immunization services.

Data management and analysis: Double data entry using EpiData entry II was employed, and description and analysis was done using STATA version 12. Tables were used to organize data, and binary logistic regression was used to identify independent factors associated with healthcare workers' readiness to provide immunization services at HCs and HPs. Findings of the analysis were reported in terms of adjusted odds ratios (AORs) and 95% confidence intervals (CIs).

Results

Background characteristics of respondents: Of the targeted sample of 1,398 respondents, 1,283 (91.8%) responded, of whom 50.3% were from HCs and 49.7% from HPs. Of the sample, 50.7% were males, 44% were between 25 and 29 years of age, and 39.3% were younger than 25 years. Of the participants, 55% were married and 41.5% were single. The majority of the respondents from the HCs were male, while those from HPs were predominately female. Among those working in the HPs, 86.3% were HEWs; 52.7% of those from HCs were nurses. With respect to educational level, 53.6% of HP staff were educated to Technical, Vocational Education and Training (TVET) level, and 23.7% to diploma level. At the HCs, 69.7% had diplomas and 22.8% had a first degree. The majority of respondents had one to four years of service (Table 1).

Table 1 : Socio-demographic characteristics of health care providers

	Health center		Health post		Total	
	No.	%	No.	%	No.	%
Age in years						
<25	231	37.0	265	41.5	496	39.3
25-29	304	48.6	252	39.5	556	44.0
30+	90	14.4	96	15.0	186	14.7
Not specified			25	3.9	25	2.0
Total	625	100.0	638	100.0	1263	100.0
Sex						
Male	470	72.9	180	28.2	650	50.7
Female	175	27.1	453	71.0	628	48.9
Not specified			5	0.8	5	0.4
Total	645	100.0	638	100.0	1283	100.0
Educational level						
<9 grade	0	0	32	5.0	32	2.5
9-12 grade	0	0	112	17.6	112	8.7
TVET	0	0	341	53.6	341	26.6
Less than diploma	49	7.6	0	0	49	3.8
Diploma	450	69.7	151	23.7	601	46.9
First degree	147	22.8	0	0	147	11.5
Total	646	100.0	636	100	1282	100.0
Marital status						
Married	311	48.1	394	62.0	705	55.0
Single	318	49.1	214	33.7	532	41.5
Other	18	2.8	27	4.3	45	3.5
Total	647	100.0	635	100.0	1282	100.0
Qualification						
HEW	0	0	549	86.3	549	42.9
Nurse	368	57.2	86	13.5	454	35.5
Midwife	180	28.0	0	0	180	14.1
HO/MD	80	12.4	0	0	80	6.3
Others	15	2.3	0	0	15	1.3
Total	643	100.0	635	100	1279	100.0
Years of service						
<1 year	84	13.7	82	13.4	166	13.5
1-4 years	408	66.6	321	52.3	729	59.4
5+ year	121	19.7	211	34.4	332	27.1
Total	613	100.0	614	100.0	1227	100.0

Training, motivation and involvement of health center respondents in EPI-related activities: Of the respondents from HCs, 77.5% claimed they had participated in at least one immunization-related training course during the two years prior to the survey, while 78.9% and 70.8% claimed that they were motivated and involved in immunization-related activities, respectively. Those who received EPI-related training during the past two years were EPI coordinators (86.8%), those in relatively older age groups (87.5%), males (80.8%), those with a diploma

(81.9%), nurses (86.2%), those currently married (81.3%), those with more than five years of service (87.8%), and those who claimed supervisory support helped them provide EPI services (82.5%). Those who were motivated were significantly varied in terms of the level of usefulness of supervisory support (89.8%), and those involved in EPI-related activities were significantly associated with being HC heads (75.7%), nurses (75.7%), and having more than five years of service (81%) (Table 2).

Table 2: Training, motivation and involvement of health center staff on EPI-related activities by characteristics of respondents

Factors	Trained		p-value	Motivated		p-value	Involved		p-value
	No.	%		No.	%		No.	%	
Location			0.734			0.360			0.051
Semi-pastoral	235	78.1		250	80.4		209	67.2	
Pastoral	257	76.9		261	77.4		250	74.2	
Total	492	77.5		511	78.9		459	70.8	
Responsibilities			0.002			0.491			0.009
EPI coordinator	145	86.8		133	78.7		125	74.0	
HC head	121	79.1		131	82.9		125	79.1	
Delivery	178	70.9		197	76.7		166	64.6	
Other	47	77.0		47	77.0		40	65.6	
Total	491	77.7		508	78.8		456	70.7	
Age in years			<0.001			0.345			0.155
<25	158	69.3		175	75.8		154	66.7	
25-29	241	80.9		245	80.9		219	72.3	
30+	77	87.5		72	80.0		69	76.7	
Total	476	77.5		492	78.8		442	70.8	
Sex			0.001			0.388			0.585
Male	374	80.8		374	79.6		330	70.2	
Female	114	67.9		133	76.4		126	72.4	
Total	488	77.3		507	78.7		456	70.8	
Highest education completed			<0.001			0.789			0.112
Diploma	363	81.9		356	78.9		327	72.5	
First degree	91	63.2		117	79.6		94	63.9	
Less than diploma	36	78.3		36	75.0		36	75.0	
Total	490	77.4		509	78.8		457	70.7	
Basic training			<0.001			0.069			0.004
Nurse	312	86.2		298	81.2		278	75.7	
Midwife	112	64.0		131	72.8		115	63.9	
HO/MD	50	64.1		66	82.5		54	67.5	
Others	12	85.7		10	66.7		7	46.7	
Total	486	77.3		505	78.7		454	70.7	
Marital status			0.026			0.085			0.069
Married	247	81.3		254	81.7		231	74.3	
Unmarried	243	73.9		255	76.1		227	67.8	
Total	490	77.4		509	78.8		458	70.9	
Years of service			0.016			0.116			0.012
≤2 years	238	73.2		250	75.3		218	65.7	
3-5 years	151	78.6		162	82.7		144	73.5	
>5 years	72	87.8		68	81.0		68	81.0	
Total	461	77.0		480	78.4		430	70.3	
Usefulness of supervisory support			0.004			<0.001			<0.001
High	320	82.5		353	89.8		342	87.0	
Medium	102	75.6		87	63.0		67	48.6	
Low	26	61.9		27	62.8		17	39.5	
Total	448	79.3		467	81.4		426	74.2	

Training, motivation and involvement of health extension workers in immunization-related activities: HEWs were asked about receiving at least one EPI-related training course in the two years prior to the survey and their motivation and involvement in EPI. Accordingly, 91.4% reported that they received at least one EPI-related training course in the past two years; 81.4% and 76.1% claimed that they were motivated and involved in EPI-related activities in HPs posts, respectively. Young age groups (up to the age of 25) were relatively more motivated (84.4%) and involved

(79.1%) in EPI-related activities. Women received training more (93%), and had higher levels of motivation (85.6%) and involvement (79.8%) in EPI-related activities compared to males ($p<0.02$). Basic training, marital status and years of service showed association with receiving training in the past two years ($p<0.05$). Those who received training and reported that they were motivated and involved were associated with a high level of satisfaction with supervisory support to improve EPI activities (Tables 2 and 3).

Table 3: Training, motivation and involvement of health post staff regarding immunization-related activities

Factors	Trained		p-value	Motivated		p-value	Involved		p-value
	No.	%		No.	%		No.	%	
Location			0.772			<0.001			0.001
Semi-pastoral	280	91.8		273	86.9		257	81.8	
Pastoral	252	91.0		240	75.5		224	70.4	
Total	532	91.4		513	81.2		481	76.1	
Respondent			0.005			0.956			0.798
HEW	468	92.7		445	81.2		418	76.3	
Other	64	83.1		68	81.0		63	75.0	
Total	532	91.4		513	81.2		481	76.1	
Age group			0.627			0.012			0.049
<25	228	92.7		222	84.4		208	79.1	
25-29	213	90.3		205	82.3		191	76.7	
30+	70	90.9		68	70.8		64	66.7	
Total	511	91.4		495	81.4		463	76.2	
Sex			0.017			<0.001			0.001
Male	129	86.6		125	70.6		120	67.8	
Female	398	93.0		385	85.6		359	79.8	
Total	527	91.3		510	81.3		479	76.4	
Educational level			<0.001			0.005			0.294
≤12 grade	105	88.2		102	73.4		103	74.1	
TVET (10+1,+2,+3)	307	96.2		292	85.6		268	78.6	
Diploma	118	83.1		118	78.7		109	72.7	
Total	530	91.4		512	81.3		480	76.2	
Basic training			0.004			0.968			0.812
HEW	467	92.8		443	81.1		416	76.2	
Nurse	64	83.1		68	81.0		63	75.0	
Total	531	91.6		511	81.1		479	76.0	
Marital status			0.048			0.443			0.534
Married	341	92.9		320	79.6		301	74.9	
Single	179	89.5		178	83.6		165	77.5	
Other	9	75.0		12	85.7		12	85.7	
Total	529	91.4		510	81.1		478	76.0	
Years of service			0.004			0.269			0.164
≤2 years	179	86.5		180	78.3		168	73.0	
3-5 years	191	96.0		173	80.5		167	77.7	
>5 years	140	90.9		139	84.8		133	81.1	
Total	510	91.1		492	80.8		468	76.8	
Usefulness of supervision to improve EPI			<0.001			<0.001			<0.001
High	324	93.4		328	94.5		324	93.4	
Medium	121	93.8		98	76.0		80	62.0	
Low	16	66.7		18	75.0		14	58.3	
Total	461	92.2		444	88.8		418	83.6	

In terms of the topics covered during training in the past two years, among HEWs, 59.4%, 40.8%, 61.8% and 76.9% received training on immunization in practice, vaccine and cold chain management or handling, injection safety and waste management, and the introduction of new vaccines, respectively. For HC staff, the comparable proportions were 51%, 58.3%, 58.4% and 53.4%.

Healthcare providers' readiness to provide

immunization services: Among HC respondents, readiness to provide immunization services was observed to vary between age groups, marital status, levels of education, basic training and years of service. Specifically, a higher level of readiness (61.1%) was observed among those who were 30+ year olds, married (59.2%), had a diploma (58.8%), nurses (62.4%), and those with more than five years of service (65.5%) (Table 4).

Table 4: Readiness of vaccination providers by characteristics and facility

	Health center					p-value	Health post					p-value
	Not ready		Ready		Total		Not ready		Ready		Total	
	No.	%	No.	%	No.		No.	%	No.	%	No.	
Location												
Semi-pastoral	145	46.6	166	53.4	311	0.698	86	27.4	228	72.6	314	0.004
Pastoral	152	45.1	185	54.9	337		121	38.1	197	61.9	318	
Total	297	45.8	351	54.2	648		207	32.8	425	67.2	632	
Sex												
Male	209	44.5	261	55.5	470	0.211	79	44.6	98	55.4	177	<0.001
Female	87	50.0	87	50.0	174		125	27.8	325	72.2	450	
Total	296	46.0	348	54.0	644		204	32.5	423	67.5	627	
Age in years												
<25	123	53.2	108	46.8	231	0.013	79	30.0	184	70.0	263	0.107
25-29	127	41.9	176	58.1	303		79	31.7	170	68.3	249	
30+	35	38.9	55	61.1	90		40	41.7	56	58.3	96	
Total	285	45.7	339	54.3	624		198	32.6	410	67.4	608	
Marital status												
Married	127	40.8	184	59.2	311	0.016	132	32.8	270	67.2	402	0.975
Single	163	51.4	154	48.6	317		70	32.9	143	67.1	213	
Other	6	33.3	12	66.7	18		5	35.7	9	64.3	14	
Total	296	45.8	350	54.2	646		207	32.9	422	67.1	629	
Highest education completed/level of education												
≤12 grade	0	0	0	0	0	<0.001	52	37.4	87	62.6	139	<0.001
TVET	0	0	0	0	0		89	26.1	252	73.9	341	
Less than diploma	23	47.9	25	52.1	48		0	0	0	0	0	
Diploma	186	41.2	265	58.8	451		65	43.3	85	56.7	150	
First degree	88	59.9	59	40.1	147		0	0	0	0	0	
Total	297	46.0	349	54.0	646		206	32.7	424	67.3	630	
Basic training or profession												
HEW	0	0	0	0	0	<0.001	172	31.5	374	68.5	546	0.103
Nurse	138	37.6	229	62.4	367		34	40.5	50	59.5	84	
Midwife	102	56.7	78	43.3	180		0	0	0	0	0	
HO/MD	47	58.8	33	41.3	80		0	0	0	0	0	
Others	9	60.0	6	40.0	15		0	0	0	0	0	
Total	296	46.1	346	53.9	642		206	32.7	424	67.3	630	
Years of service												
≤2 years	173	52.1	159	47.9	332	0.006	90	39.1	140	60.9	230	0.021
3-5 years	83	42.3	113	57.7	196		61	28.4	154	71.6	215	
>5 years	29	34.5	55	65.5	84		46	28.0	118	72.0	164	
Total	285	46.6	327	53.4	612		197	32.3	412	67.7	609	

Among HEWs, readiness varied between location, sex, level of education, and years of service. Accordingly, readiness to provide vaccination services was observed to be higher in semi-pastoral areas (72.6%), in females (72.2%), in those with a TVET level of education (73.9%), and in those with more than two years of service (71.8%) (Table 4).

Factors associated with readiness of immunization service providers: Among factors considered, educational level, basic profession or training, and satisfaction with supportive supervision received

were found to be independently and significantly associated with readiness to provide immunization services among HC staff. Accordingly, comparing various categories with each other in terms of their readiness to provide immunization services, those with a diploma were more likely than those with a first degree (OR=2.27, 95% CI: 1.27–4.06); nurses were more likely than midwives (OR=2.12, 95% CI: 1.37–3.27); and those who claimed they were highly satisfied with supervision support were more likely than those who claimed a medium level of satisfaction (OR=6.15, 95% CI: 3.54–9.61)(Table 5).

Table 5: Independent factors associated with readiness of healthcare workers to provide immunization service provision at health centers and health posts

Factors	AOR	p-value	95% CI for AOR	
Health center staff				
Educational level (First degree)				
Diploma	2.27	0.006	1.27	4.06
Less than diploma	1.22	0.634	0.54	2.72
Profession (Midwife)				
Nurse	2.12	0.001	1.37	3.27
HO/MD	1.36	0.436	0.63	2.95
Others	1.63	0.492	0.40	6.56
Level of satisfaction on supportive supervision (Medium)				
High	6.15	<0.001	3.94	9.61
Low	1.48	0.33	0.67	3.26
Constant	0.19	0.000	0.08	0.45
Health post staff				
Sex (Male)				
Female	2.17	0.002	1.33	3.55
Years of service (≤ 2 years)				
3-5 years	1.66	0.058	0.98	2.81
>5 years	2.20	0.008	1.23	3.94
Level of satisfaction on supportive supervision (Medium)				
High	4.46	<0.001	2.72	7.32
Low	0.41	0.067	0.16	1.06
Constant	0.51	0.034	0.28	0.95

For HPs, sex, years of service and satisfaction with supervisory support were independently and significantly associated with readiness to provide immunization services. Accordingly, compared to males, females were more likely to be ready (OR=1.66, 95% CI: 1.33–3.55); those with greater than five years' service were more likely to be ready than those with up to two years' service (OR=2.20, 95% CI: 1.23–3.94); and those whose level of satisfaction with supervisory support was high were more likely to be ready than those with a medium level of satisfaction (OR=4.46, 95% CI: 2.72–7.32)(Table 5).

Discussion

Most of the previous studies on the topic of readiness focused on overall organizational change or specific activities of the health facilities (16,18,19). In this analysis, we used and categorized health providers' readiness to provide immunization services based on measures of training, motivation and involvement.

The present study indicated that those in HCs had relatively lower readiness compared to those in HPs – almost two-thirds of HEWs showed readiness. This could be due to the fact that locally recruited HEWs are active and participate within the community to improve immunization coverage (15,20). Moreover, another study also indicated that significant positive

associations were found between exposure to the HEP and the uptake of child vaccination (21).

Compared to professionals with a first degree, those with a diploma were more likely to show readiness for immunization services at HCs. On the other hand, a study conducted in Saudi Arabia showed no difference between physicians and nurses with respect to dealing with vaccination issues (22). Work burden may also play a role in the lower readiness level of those with first degrees, as in most cases they are responsible for clinical as well as preventive services, unlike those with diplomas. In addition, satisfaction with supportive supervision showed a marked effect on the readiness of HC staff to provide immunization services.

In the HPs, female HEWs were more likely to be ready for immunization service provision than their male counterparts.

Years of service in HPs showed a significant impact on the readiness of HEWs. Working for more than five years in the health care sector was significantly associated with a better level of readiness. HEWs are recruited from the communities in which they work and are provided with one year of training. Upon completion of the training, they are assigned to the HP in pairs and salaried to work(23).They also receive a shorter-term training and use of distance learning for

upgrading their status, which encourages them to stay longer in their assigned areas(24).

Training is one of the interventions that helps improve immunization service delivery at all health facility levels. Basic and refresher training on topics of immunization for the health providers would make them ready for their daily activities. Effective training on immunization increased knowledge and improved vaccination coverage (25). Training and providing updated information creates confidence for health providers and makes them ready for immunization. A study in Mozambique (14) illustrated that health workers working in remote locations, far from the health center, did not have access to training and supervision, and did not show readiness for immunization service delivery.

Our study shows that those who had medium or low levels of satisfaction with the supervision support they received were less likely to be ready for immunization services. Regular supervision and on-the-job training is very important to engage health providers and increase the overall performance of immunization activities (26). In practice, however, the quality of health workers' supervision is highly variable due to a lack of skills and tools, limited transportation resources, financial obstacles, and cultural factors in local health systems. A study conducted in Botswana suggested that effective supervision of health workers and community health workers can be motivational, and create a sense of legitimacy for both health workers and the communities they serve (27).

Conclusions and recommendations

The findings of this study showed that the overall readiness level of immunization service provision in PHCUs in hard-to-reach pastoral and semi-pastoral areas is generally low, with differences between HCs and HPs. The main factors that are positively associated with HC workers are having a diploma, being a nurse, and having a high satisfaction level in relation to supportive supervision. Among HP staff, being female, having more than five years of work experience and being highly satisfied with supportive supervision contributed to a better level of readiness. To ensure a better level of readiness among health workers in immunization services in general, improving supportive supervision by maximizing satisfaction levels is an area that program coordinators and concerned bodies need to address. Although workload-related matters might be a contributory factor, those health workers with relatively better education should be given due attention to improve their readiness. Therefore, improving supportive supervision and continuous in-service training are required. For future assessments of health workers' readiness to provide immunization services, we recommend the development of better measurement procedures and tools that might include other components of service delivery activities.

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