

**SORT IT SUPPLEMENT: POST-EBOLA RECOVERY IN WEST AFRICA****The Ebola outbreak and staffing in public health facilities in rural Sierra Leone: who is left to do the job?**J. Sylvester Squire,<sup>1</sup> K. Hann,<sup>2</sup> O. Denisiuk,<sup>3</sup> M. Kamara,<sup>1</sup> D. Tamang,<sup>4</sup> R. Zachariah<sup>5</sup><http://dx.doi.org/10.5588/pha.16.0089>**Setting:** The 82 public health facilities of rural Kailahun District, Sierra Leone.**Objective:** The 2014–2015 Ebola virus disease outbreak in Sierra Leone led the Ministry of Health and Sanitation and stakeholders to set minimum standards of staffing (medical/non-medical) for a basic package of essential health services (BPEHS). No district-level information exists on staffing levels in relation to the Ebola outbreak. We examined the staffing levels before the Ebola outbreak, during the last month of the outbreak and 4 months after the outbreak, as well as Ebola-related deaths among health care workers (HCWs).**Design:** This was a retrospective cross-sectional study.**Results:** Of 805 recommended medical staff (the minimum requirement for 82 health facilities), there were deficits of 539 (67%) pre-Ebola, 528 (65%) during the Ebola outbreak and 501 (62%) post-Ebola, hovering at staff shortages of >50% at all levels of health facilities. Of the 569 requisite non-medical staff, the gap remained consistent, at 92%, in the three time periods. Of the 1374 overall HCWs recommended by the BPEHS, the current staff shortage is 1026 (75%). Of 321 facility-based HCWs present during Ebola, there were 15 (14 medical and one non-medical staff) Ebola-related and three non-Ebola related deaths among HCWs.**Conclusion:** The post-Ebola health-related human resource deficit is alarmingly high, with very few staff available to work. We call for urgent political will, resources and international collaboration to address this situation.

The 2014 Ebola virus disease outbreak, which principally affected Guinea, Liberia and Sierra Leone, was by far the largest, most prolonged and most devastating Ebola outbreak in history,<sup>1,2</sup> and was declared an international public health emergency by the World Health Organization (WHO) in August 2014.<sup>2</sup> By January 2016, 28 601 Ebola cases had been reported in the three countries, with 11 300 deaths. Sierra Leone was one of the worst affected countries, with all 14 medical districts affected and a total of 14 122 reported cases and 3955 deaths.<sup>3</sup>

The outbreak took a devastating toll on health care workers (HCWs), with 300 infected and 221 Ebola-related HCW deaths.<sup>3</sup> Prior to the Ebola outbreak, Sierra Leone was already facing severe HCW shortages due to a long period of conflict of more than a decade. The country is challenged by one of the highest patient-to-physician ratios in the world—50 000 patients

per physician—compared to approximately 400 patients per physician in the USA.<sup>4</sup> It is estimated that Ebola-related HCW deaths contributed to a further 21% loss in the overall health workforce.<sup>5</sup> This is attributed to a weak health system and lack of adequate infection prevention and control (IPC).<sup>6</sup>

Other factors may have led to further HCW attrition. The death of HCWs due to Ebola may, for example, have provoked anxiety and concerns about occupational risk among health care personnel, which may have led to some staff leaving the health service.<sup>7</sup> The repurposing of HCWs between geographic regions for the Ebola outbreak or other health care priorities may also have affected availability.<sup>8</sup>

The Ministry of Health and Sanitation (MoHS) has set specific staffing standards for all public health facility levels in Sierra Leone. These recommendations are included in the Basic Package of Essential Health Services (BPEHS) document for improving health service delivery in Sierra Leone.<sup>9</sup> A PubMed search revealed no published studies on whether these staffing levels are being met at the district level and how possible gaps were aggravated by the Ebola epidemic. Furthermore, the Ebola-related HCW deaths reported by the WHO have not been stratified by staff cadre.<sup>3</sup> Due to budgetary limitations on paying salaries, many HCWs serve in health facilities as volunteers and are not on a regular payroll. The majority of these HCWs are thus not captured in routine data systems.

Information on these critical human resource issues is vital as Sierra Leone and its donor community begin to bridge the human resource gaps. We therefore aimed to assess staffing levels in all public health facilities of the rural district of Kailahun in Sierra Leone in relation to the 2014 Ebola outbreak.

We examined the overall staffing levels (medical and non-medical) in relation to the BPEHS standards and the proportion of staff on the regular payroll in all the Kailahun District public health facilities before the Ebola outbreak, in the last month of the outbreak and 4 months after the end of the outbreak. We also determined the number of Ebola-related deaths stratified by staff cadre and current shortages in district-level human resources.

**METHODS****Study design**

This was a comparative cross-sectional study using routine programme data from three time periods.

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## Setting

### General setting

Sierra Leone has an estimated population of 6 million, of whom approximately 70% live below the poverty line despite decades of gold, bauxite, titanium and diamond mining.<sup>9</sup> The country's indices for maternal and infant mortality are among the worst in the world, ranking respectively fifth and eleventh. This is partly due to the period of civil conflict (1991–2002) that devastated the country and its health system. Even before the Ebola outbreak, there were only two doctors and 17 nurses per 100 000 population, most of whom were situated in urban areas.<sup>9</sup>

The health infrastructure is tiered into tertiary hospitals, district hospitals and peripheral health units (PHUs), which are designed to deliver primary health care for the country. The PHUs include community health centres (CHCs), community health posts (CHPs) and maternal and child health posts (MCHPs).

### Specific setting

Kailahun District, located in the Eastern Province of Sierra Leone, borders Liberia to the east and Guinea to the north. The district has an estimated population of 466 815. There are 82 functional public health facilities in the district, including one secondary level hospital and 81 PHUs (14 CHCs, 48 CHPs and 19 MCHPs).

Kailahun District had 565 reported cases of Ebola and 228 deaths (50%) during the 2014–2015 outbreak.<sup>10</sup> All Ebola cases and deaths, including HCW deaths, were entered into a dedicated Ebola database available at the district level. Kailahun was chosen as

the study site because it was the first district affected by the Ebola outbreak.

### Basic Package of Essential Health Services and staffing levels

In January 2015, a multi-stakeholder consultation on building a resilient health system in Sierra Leone was convened with participants representing the MoHS, district councils, development partners and non-governmental organisations. This meeting resulted in the development of the 2015 edition of the BPEHS, which recommends minimum standards for HCWs (the number for each cadre of health worker) for each health facility level, to contribute to a strengthened health system post-Ebola.<sup>11</sup> The BPEHS is based on estimated human resource needs. Table 1 outlines each facility level, its intended catchment area and the type of services, according to the BPEHS.

### Study population and period

All HCWs practising in all public health facilities in Kailahun District were included in the study. We assessed the staff levels at three points in time: during the pre-Ebola period (April 2014), at the end of the outbreak (November 2015) and 4 months post-Ebola (March 2016): April 2014, immediately prior to the Ebola outbreak in Sierra Leone, is representative of the human resource situation before the outbreak; November 2015, the month in which Sierra Leone was declared Ebola-free, is representative of the end-situation after Ebola; and March 2016 was selected because the revised BPEHS was launched one year before this date,

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**TABLE 1** Health facility levels at district level for delivery of the BPEHS in Sierra Leone

Health facility level	Target population	Type of service
Maternal and child health post	500–5000 within 5 km	Antenatal care, routine deliveries, postnatal care, neonatal care Routine vaccination, treatment of childhood illnesses and malnutrition Basic first aid Community outreach services Surveillance for epidemic-prone diseases
Community health post	5 000–10 000 within 8 km	All of the above including: Management of certain pregnancy complications and complicated deliveries Treatment of certain severe childhood illnesses
Community health centre	10 000–30 000 within 15 km	Basic emergency obstetric and neonatal care Treatment of certain severe childhood illnesses Laboratory and pharmacy services Screening and referral of some non-communicable diseases
District hospital	500 000 serving the district coverage area	Comprehensive emergency obstetric and neonatal care Treatment of severe childhood illnesses, including severe acute malnutrition with complications Diagnosis and treatment of severe malaria Clinical management of non-communicable diseases Laboratory and pharmacy services; diagnostic imaging; blood services and surgery Surveillance, detection and treatment of epidemic-prone diseases Emergency triage

BPEHS = Basic Package for Essential Health Services.

**TABLE 2** Overall medical staffing levels and gaps in relation to the recommended BPEHS standards assessed in the pre-Ebola, Ebola and post-Ebola periods\* in Kailahun District, Sierra Leone

Facilities	Human resources	Pre-Ebola <i>n</i> (%)	Ebola <i>n</i> (%)	Post-Ebola <i>n</i> (%)
Total staff	Recommended	805		
	Actual	266	277	304
	Human resource gap	539 (67)	528 (66)	501 (62)
Health facility levels				
	District hospital			
	Recommended	256		
CHC	Actual	66	77	98
	Human resource gap	190 (74)	179 (70)	158 (62)
	Recommended	252		
CHP	Actual	71	77	77
	Human resource gap	181 (72)	175 (69)	175 (69)
	Recommended	240		
MCHP	Actual	104	101	110
	Human resource gap	136 (57)	139 (58)	130 (54)
	Recommended	57		
	Actual	25	22	19
	Human resource gap	32 (56)	35 (61)	38 (67)

\*Pre-Ebola period = April 2014; Ebola period = November 2015; post-Ebola period = March 2016.

BPEHS = Basic Package of Essential Health Services; CHC = community health centre; CHP = community health post; MCHP = maternal and child health post.

and some progress in terms of human resources (recruitment and posting) could be expected.

### Data variables, sources of data and analysis

The data variables related to the study objectives were sourced from the monthly district staff list (DHIS), the human resource management information system (HRMIS) and a dedicated Ebola viral haemorrhagic fever database that collates information on Ebola infections and related deaths. These data were available and analysed in Microsoft Excel (2013) files (Microsoft Corp, Redmond, WA, USA). The variables included types of staff (medical, non-medical), types of cadres and whether or not they were on the regular payroll.

Gaps in staffing levels in relation to the Ebola outbreak were calculated by subtracting the actual levels from the required levels. Results were expressed using numbers and percentages.

### Ethics approval

Permission for the study was obtained from the Sierra Leone Scientific and Ethics Review Board (MoHS, Freetown) and the Ethics Advisory Group of the International Union Against Tuberculosis and Lung Disease (Paris, France). As this study used anonymised programme data without identifiers, informed consent was not needed.

## RESULTS

### Staffing levels in relation to the Basic Package of Essential Health Services standards

Staffing levels were assessed in all of the 82 public health facilities in the district. Table 2 shows medical staffing levels in relation to the recommended BPEHS standards. For the health facilities in Kailahun District, the BPEHS recommends a total of 805 medical staff. Eleven additional roles were filled during the Ebola period compared to the pre-Ebola period, and 27 between the Ebola and post-Ebola periods (Table 2). The human resource gaps in the pre-Ebola, Ebola and post-Ebola periods were respectively 539 (67%), 528 (66%) and 501 (62%). Currently (post-Ebola), there-

fore, only 38% of total medical human resource requirements are being met. When stratified by health facility levels, human resource shortages ranged between 54% and 69%.

Table 3 shows overall non-medical staffing levels in relation to BPEHS standards. Only one additional role was filled during the Ebola and post-Ebola periods (Table 3). Of the 569 staff members needed, the gap remained consistently at 92% across the three time points of assessment. Gaps were evident across all health facility levels.

### Health care workers on the regular payroll

In the pre-Ebola, Ebola and post-Ebola periods, there were respectively 309, 321 and 348 HCWs, of whom respectively 278 (90%), 282 (88%) and 289 (83%) were on the payroll. The denominators included registered volunteer staff stationed at health facilities, even if they received no remuneration.

### Ebola-related deaths stratified by human resource cadre

Table 4 shows the Ebola- and non-Ebola-related deaths stratified by human resource cadre during the Ebola outbreak. Of 321 HCWs present at facilities during the Ebola outbreak, there were three non-Ebola-related deaths and 15 Ebola-related deaths, including 14 medical (including nurses) and one non-medical staff. For medical cadres, death was most frequent among maternal and child health aides (MCHAs) and state enrolled community health nurses (SECHNs).

### Current (post-Ebola) district-level human resource deficits stratified by cadre

Tables 5 and 6 show the deficits in post-Ebola district-level human resources. Of the 1374 HCWs mentioned as the requisite number by the BPEHS, only 348 (25%) are currently available, revealing a deficit of 75%. Stratified by medical and non-medical cadres, the human resource deficit was respectively 501 (62%) and 525 (92%). The two cadres with the highest number of available staff were the MCHAs ( $n = 100$ ) and the SECHNs ( $n = 100$ ). MCHAs, SECHN midwives and state registered nurses (SRNs) had the greatest staff shortages.

**TABLE 3** Overall non-medical staffing levels and gaps in relation to the recommended BPEHS standards assessed in the pre-Ebola, Ebola and post-Ebola periods\* in Kailahun District, Sierra Leone

Facilities	Human resources	Pre-Ebola <i>n</i> (%)	Ebola <i>n</i> (%)	Post-Ebola <i>n</i> (%)
Total staff	Recommended	569		
	Actual	43	44	45
	Human resource gap	526 (92)	525 (92)	524 (92)
Health facility levels				
	District hospital			
	Recommended	88		
CHC	Actual	31	31	31
	Human resource gap	57 (65)	57 (65)	57 (65)
	Recommended	98		
CHP	Actual	9	9	10
	Human resource gap	89 (91)	89 (91)	88 (90)
	Recommended	288		
MCHP	Actual	3	4	3
	Human resource gap	285 (99)	284 (99)	285 (99)
	Recommended	95		
	Actual	0	0	0
	Human resource gap	95 (100)	95 (100)	95 (100)

\*Pre-Ebola period = April 2014; Ebola period = November 2015; post-Ebola period = March 2016.

BPEHS = Basic Package of Essential Health Services; CHC = community health centre; CHP = community health post; MCHP = maternal and child health post.

## DISCUSSION

This is one of the first studies to assess deficits in human resources for health services at rural district level in the context of the 2014–2015 Ebola outbreak. The findings are alarming, with a 62% deficit for medical staff and a 92% deficit for non-medical staff.

These findings are important, as they allow us to set out concrete steps to bridge the identified gaps. There were early signs of favourable political will to improve the state of health-related human resources in the post-Ebola period, as evidenced by the 2015 revision of the BPEHS standards. These results, however, provide compelling evidence of the considerable gap that currently exists between rhetoric and action.

The strengths of the study are that we included all public health facilities and all human resource cadres for a district. Data were available from before, during and after the outbreak, allowing the trends to be examined. The study also addresses an identified operational research priority for Sierra Leone and other Ebola-affected West African countries. This study is therefore timely both to inform policy and practice as well as to foster donor support.

The main limitation of the study is that the data may have excluded staff working on a volunteer basis, i.e., those not on the regular payroll. We may therefore have exaggerated the actual human resource deficits at facility level. This notwithstanding, the dramatic level of overall staff shortages (67% for medical and 92% for non-medical staff) implies that even if some data were missing, this would be unlikely to attenuate the dramatic picture portrayed by our findings. The deficits in staff (percentages) remained relatively stable despite the Ebola-related staff deaths, as the background staff deficits were already high in relation to the attrition caused by the outbreak. Furthermore, we may have underestimated district-level Ebola-related HCW deaths, as our analyses were restricted to facility-based HCWs, excluding community-based and district-level HCWs.

A number of important policy and practice implications can be derived from these results. First, to achieve the recommended staffing levels for Kailahun District in line with the BPEHS road

**TABLE 4** Ebola- and non-Ebola-related deaths by human resource cadre in the Ebola virus disease outbreak period in Kailahun District, Sierra Leone, April 2014–November 2015

Cadre	Ebola-related deaths* <i>n</i>	Non-Ebola related deaths† <i>n</i>
Medical	14	2
Community health officer	1	0
MCH aide	6	1
Nursing aide	1	1
Public health aide	1	0
State enrolled community health nurse	5	0
Non-medical	1	1
Cleaner	0	1
Driver	1	0
Total	15	3

\*Calculated using the dedicated Ebola viral haemorrhagic fever database. There are known gaps in this database, with underreporting of health worker deaths.

†Calculated using the Ministry of Health and Sanitation Human Resource Management Information System (data missing for November 2014–January 2015, May 2015 and August–September 2015).

MCH = maternal and child health.

map for 2020, the Government of Sierra Leone will need to bridge the current human resource deficit by attracting a total of 1026 workers to the health facilities in the district over the next 4 years. This translates into roughly 256 workers per annum who will need to be identified and deployed to Kailahun District. Achieving this considerable task will require ambitious, exceptional measures that go well beyond routine. Such measures could include rapid employment of non-medical and support staff, which should be possible if financial resources are made available immediately; employment of trained, available HCWs in the country who are currently out of public service; and reinstatement of retired medical personnel still able to work. Macro-economic restrictions on fiscal space, and in particular the wage bill

**TABLE 5** Medical staffing levels recommended by BPEHS standards (by cadre), and current human resource deficits assessed post-Ebola\* in Kailahun District, Sierra Leone

Medical staff cadres	Recommended levels (BPEHS) <sup>†</sup> <i>n</i>	Current levels (post-Ebola) <i>n</i>	Current deficit <sup>‡</sup> <i>n</i>
Accident and emergency nurse	2	0	2
Anaesthetist	1	0	1
Assistant anaesthetist (nurse/CHO)	3	1	2
Assistant nutritionist	15	0	15
Clinical officer	6	0	6
Clinical pharmacist	1	0	1
Clinical psychologist	1	0	1
Community health assistant	62	13	49
Community health officer	29	20	9
Community mental health aid	14	0	14
Critical care nurse	2	0	2
Dental nursing auxiliary/assistant	1	0	1
Dental surgeon (dentist)	1	0	1
Dental technician	2	0	2
Dental therapist/hygienist/nurse	1	0	1
ENT assistant	1	0	1
Environmental health officer	15	0	15
Family physician	1	0	1
General surgeon	1	0	1
Health education officer	1	0	1
Internal medicine physician	1	0	1
Laboratory assistant	18	8	10
Laboratory technician	17	10	7
Maternal and child health aide	209	100	109
Medical laboratory scientific officer	1	0	1
Medical officer	6	2	4
Mental health CHO	2	0	2
Mental health nurses	2	1	1
Midwife (SECHN)	76	3	73
Nursing aide	48	33	15
Nursing officer	8	0	8
Nutritionist	1	2	-1
Obstetrics and gynaecology	1	0	1
Ophthalmic CHO	1	0	1
Ophthalmic nurse	4	0	4
Optician	1	0	1
Optometrist	1	0	1
Paediatrician	1	0	1
Paediatric nurse	2	0	2
Pharmacist	2	0	2
Pharmacy technician	20	5	15
Physiotherapist	2	0	2
Public health aide	16	0	16
Public health physician	1	0	1
Radiology assistant	1	0	1
Senior nursing officer	4	0	4
State enrolled community health nurse	124	100	24
State registered nurse	48	0	48
State registered nurse midwife	8	6	2
Theatre nurse	18	0	18
X-ray technician	1	0	1
Total	805	304	501 (62%)

\*March 2016.

<sup>†</sup>Recommended numbers of health workers for 82 health facilities, including 19 maternal and child health posts, 48 community health posts, 14 community health centres and 1 district hospital in Kailahun District, Sierra Leone.<sup>‡</sup>Compared to BPEHS-recommended<sup>§</sup> levels.<sup>§</sup>Basic Package of Essential Health Services document for improving health service delivery in Sierra Leone.

CHO = community health officer; ENT = ear, nose and throat; SECHN = state enrolled community health nurse.



**TABLE 6** Non-medical staffing levels recommended by BPEHS standards (by cadre), and current human resource deficits assessed post-Ebola\* in Kailahun District, Sierra Leone

Non-medical staff cadres	Recommended levels (BPEHS) <sup>†</sup>	Current levels (Post-Ebola)	Current deficit <sup>‡</sup>
	<i>n</i>	<i>n</i>	<i>n</i>
Assistant finance officer	1	0	1
Caterer	2	0	2
Cleaner	358	22	336
Cook	6	2	4
Dental receptionist	1	0	1
Driver	3	0	3
Finance officer	1	1	0
Hospital maintenance team (plumber, carpenter, electrician/electronics, mason, painter, mechanic, etc.)	5	0	5
Hospital manager	1	0	1
Hospital secretary	1	1	0
ICT technician	1	0	1
Launderer	6	1	5
Logistics officer	1	0	1
Medical equipment technician	2	0	2
Medical records assistant	3	0	3
Medical records officer	1	1	0
Mental health social worker	1	0	1
Mortician	1	0	1
Mortuary attendant	3	0	3
Porter	12	10	2
Procurement assistant	1	0	1
Registration clerk	1	0	1
Rehabilitation worker	2	0	2
Security officer	155	6	149
Total	569	44	525 (92%)

\*March 2016.

<sup>†</sup>Recommended numbers of health workers for 82 health facilities, including 19 maternal and child health posts, 48 community health posts, 14 community health centres and one district hospital in Kailahun District, Sierra Leone.

<sup>‡</sup>Compared to BPEHS-recommended<sup>§</sup> rates.

<sup>§</sup>Basic Package of Essential Health Services document for improving health service delivery in Sierra Leone.

ICT = information communication technology.

imposed by the International Monetary Fund, hampers recruitment and adequate salary levels. This issue needs to be tackled head-on.<sup>12</sup> A temporary but not mutually exclusive option would be to bring in medical staff from other countries.

Second, these immediate measures will need to be coupled with medium- and longer-term strategies to train the new HCWs. A sensible way forward would be the establishment of regional training schools focusing on medical cadres that require between 1 and 4 years of studies, such as SECHNs, SRNs, community health officers and midwives. This would help to ensure that at the subnational level there are sufficient numbers of candidates from the cadres that are the pillars of the health system in countries such as Sierra Leone. These steps should be preceded by a national census of HCWs to identify trained but currently unemployed individuals who could be absorbed into the public services. Outdated and redundant curricula need to be revised and adapted to the local context, as most curricula may not have taken contextual needs into consideration.<sup>13</sup> In our study, the worst staff shortages were observed for SECHNs and MCHAs—cadres for which training schools exist at district and regional levels. There is also a pressing need to ensure a living wage for all HCWs and to consider other effective strategies for retention that are not hampered by hurdles such as wage limitations imposed by donor agencies.<sup>12</sup> HCWs not on the

payroll do not get paid a salary. Other incentives, such as performance-based financing and stipends for training and national campaigns, may help. These incentives, however, do not constitute a living wage. Bold ambitions will need to be matched with strong political will and coupled with a drastic increase in funding for human resources for health, including funding to cover the costs of infrastructure and staffing for training schools. The review and adaptation of medical and non-medical curricula will require greater collaboration with the WHO and other academic, technical and operational partners.

Third, the tragically high numbers of Ebola-related HCW deaths herald the need for dedicated resources and a paradigm shift in our current approach to HCW safety and occupational health in the Ebola-vulnerable countries of West Africa. We reiterate our former call to the WHO to establish a dedicated unit to guide and support occupational health and HCW safety.<sup>14</sup> Interventions might include training in and provision of IPC for both skilled and unskilled workers, and the provision of post-exposure prophylaxis and vaccinations<sup>15</sup> for HCWs. This will need to be coupled with effective partnerships with the MoHS, which should also establish dedicated, well-resourced units at country level. Such bold suggestions need to be taken on board to prevent a repeat of the situation in future outbreaks.

Fourth, the massive 92% shortage in non-medical staff has major implications for future Ebola and other infectious disease outbreaks. Essential services for IPC, such as screening and triage, health facility and personal hygiene and waste management, all rely on non-medical staff. In this light, Kailahun District is woefully unprepared with, for example, only 6% of cleaners available of the estimated 358 that are required.

Finally, the issue of non-registered volunteer staff is of concern. If they are not captured by information systems, such staff may be overlooked in assessing district-level training requirements for HCWs' safety and occupational health. They may also be left out when facility requirements for personal protective equipment are being considered. Volunteers will thus be more susceptible to both acquiring and transmitting infectious diseases to co-workers, patients and the community at large. One weak link in the IPC chain will compromise the safety of all.

In conclusion, this study provides a sobering insight into the post-Ebola state of human resources for health in a rural district level in Sierra Leone. There is essentially a human resource crisis with hardly anyone left to do the job. This critical shortage in human resources urgently needs to be addressed for future response to infectious disease outbreaks, including Ebola. We call for strong political will, international collaboration and generous funding to change the current state of affairs.

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**Contexte :** Les 82 structures de santé publiques dans le district rural de Kailahun, Sierra Leone.

**Objectif :** La flambée d'Ebola en 2014–2015 en Sierra Leone a amené le Ministère de la santé avec ses partenaires à établir des normes minimales de personnel (médical/non médical) pour les services de santé de base essentiels (BPEHS). Il n'existe pas d'informations relatives aux taux de personnel dans les districts par rapport la flambée d'Ebola. Nous avons examiné les taux de personnel avant la flambée, pendant le dernier mois de la flambée et 4 mois après Ebola, ainsi que les décès des travailleurs de santé liés à Ebola.

**Schéma :** Une étude rétrospective transversale.

**Résultats :** Sur 805 travailleurs de santé recommandés (le nombre minimum requis pour 82 structures de santé), les déficits ont été de 539 (67%) pré Ebola, de 528 (65%) pendant Ebola et de 501 (62%)

post Ebola et sont restés au-dessus de 50% à tous les niveaux des structures de santé. Sur 569 membres du personnel non médical requis, le déficit est resté régulièrement à 92% aux trois moments mesurés. Sur 1374 travailleurs de santé recommandés au total par BPEHS, le déficit de personnel actuel est de 1026 (75%). Sur 321 travailleurs de santé basés dans des structures de santé et présents pendant Ebola, il y a eu 15 décès liés à Ebola (14 travailleurs médicaux et un travailleur non-médical) et trois décès sans relation avec Ebola parmi le personnel de santé.

**Conclusion :** Les déficits en ressources humaines liées à la santé après Ebola sont alarmants, avec très peu de personnel restant. Nous appelons en urgence une volonté politique, la mobilisation de ressources et une aide internationale pour faire face à cette situation.

**Marco de referencia:** Ochenta y dos establecimientos de atención de salud en el distrito rural de Kailahun en Sierra Leona.

**Objetivo:** Como respuesta a la epidemia de fiebre hemorrágica del Ébola en Sierra Leona en el 2014 y el 2015, el Ministerio de Salud y Saneamiento en asociación con las partes interesadas elaboraron un conjunto de normas mínimas sobre la dotación de personal (médico y paramédico), destinado a la prestación de servicios básicos de salud. No existe información a escala distrital sobre el nivel de dotación de personal relacionado con la epidemia del Ébola. En el presente estudio, se examinaron los recursos de personal existentes antes de la epidemia, durante el último mes del brote y 4 meses después; se analizaron además las defunciones de profesionales de salud causadas por esta epidemia.

**Método:** Un estudio transversal retrospectivo.

**Resultados:** De los 805 miembros recomendados en la plantilla de personal médico (requisito mínimo para 82 establecimientos), se observó un déficit de 539 personas antes de la epidemia (67%), 528

durante la misma (65%) y 501 después del fin del brote epidémico (62%); la deficiencia fue superior al 50% en todos los niveles de los establecimientos sanitarios. Con relación a los 569 profesionales necesarios, diferentes del personal médico, se observó una deficiencia constante de 92% en los tres momentos del análisis. En general, de los 1374 profesionales de salud recomendados para prestar los servicios básicos de salud, la carencia actual es de 1026 personas (75%). En los 321 profesionales que trabajaban en los establecimientos de salud durante el brote, ocurrieron 15 defunciones causadas por la epidemia (14 miembros del personal médico y un miembro de otra categoría) y tres defunciones independientes de la misma.

**Conclusión:** La deficiencia en la dotación de recursos humanos para la atención de salud después de la epidemia del Ébola es alarmante, pues son muy escasas las personas que cumplen hoy esta función. Se hace un llamado urgente a la voluntad política, la movilización de recursos y la ayuda internacional a fin de corregir la situación actual.