ABSTRACT
The COVID-19 pandemic had multiple adverse impacts on the health workforce that constrained their capacity to contain and combat the disease. To mitigate the impact of the pandemic on the Ghanaian health workforce, the government implemented a strategy to recruit qualified but unemployed health workers to fill staffing gaps and incentivise all public sector health workers. This paper estimated the cost of the new recruitment and incentives given to health workers and presented lessons for health workforce planning in future health emergencies towards health systems resilience. Between March and November 2020, 45,107 health workers were recruited, representing a 35% boost in the public sector health workforce capacity, and an increase in the recurrent public health sector wage bill by about GH¢103,229,420 (US$17,798,176) per month, and about GH¢1.24 billion (US$213.58 billion) per annum. To incentivise the health workforce, the government announced a waiver of personal income taxes for all health workers in the public sector from April to December 2020 and offered a 50% additional allowance to some health workers. We estimate that the Government of Ghana spent about GH¢16.93 million (equivalent to US$2.92 million) monthly as COVID-19 response incentives, which translates into US$35 million by the end of 2020. Ghana invested considerably in health workforce recruitment and incentives to respond to the COVID-19 pandemic, resulting in an almost 37% increase in the public sector wage bill. Strengthening investments in decent employment, protection and safety for the health workforce using the various resources are helpful in addressing future pandemics.

INTRODUCTION
The COVID-19 pandemic has had multiple impacts on the health workforce (HWF), including infections and mortalities, violence and harassment, discrimination, burn-out, and mental disorders. These impacts reduced the available stock of health workers in many countries, contributing to the weakening of the health systems’ capacity to respond to the pandemic. It also increased the workload and psychosocial stress, which adversely impacted the well-being of health workers. All these further constrained the capacity of the HWF to contain and combat the disease.

The economic shock imposed by the pandemic and the resultant response measures adopted by countries also constrained both the public and private sectors’ ability to mobilise resources and expand fiscal and financial space to recruit newly trained health workers. This exacerbated the unemployment of health workers in a situation that otherwise required more health workers. Finally, owing to the resultant strain the pandemic imposed on global health systems, developed countries resorted to heightened reliance on international recruitments to fill staffing gaps, which, in turn, fuelled excessive out-migration from the Africa region in recent months.
example, a report by the Organisation for Economic Co-operation and Development (OECD) noted that in the context of COVID-19, ‘many OECD countries have recognised migrant health workers as key assets and introduced policies to help their arrival and the recognition of their qualifications’.8

Before the pandemic, Ghana had increased its public sector employed HWF density from 10.7 doctors, nurses and midwives per 10,000 in 2005 to 26.5 by 2018.9 However, using a more comprehensive and updated dataset that covers the public and private sectors, including those unemployed, in 2021, Ghana had an estimated 6173 doctors and 125,024 (both professionals nurses and associate/enrolled/community nurses) and 12,786 midwives.10 These estimates translate into a density of 45.37 doctors, nurses and midwives per 10,000 population as compared with the global threshold of 44.5 needed to make progress towards the tracer indicators of the sustainable development goal three.11 Nonetheless, the country is faced with HWF challenges with an estimated 20,000–30,000 health workers, especially nurses and midwives, potentially unemployed,12 and inequitable distribution, which was costing the Government an equivalence of 28% of its wage bill in 2018.13 In Ghana, COVID-19 HWF infections mimicked the global HWF infection trend. A total of 3656 health worker infections, representing about 7.6% of the total number of reported infections (ie, 48,643) and 2.7% of the total number of public sector HWF (ie, 135,746), as recorded at the end of October 2020 (GHS, 2020). As the pandemic unfolded, there were guidelines14 15 and calls16 to adequately prepare the HWF to respond to the health emergency. Suggested approaches for achieving this included tackling existing shortages of health workers, updating the knowledge and skills of health workers, ensuring timely payments of salaries and allowances to avoid industrial strike actions, and improving health worker safety and protection.14

To mitigate the impact of the pandemic on the Ghanaian HWF, the Government of Ghana, on 5 April 2020, announced a strategy to rapidly recruit qualified but unemployed health workers to fill staffing gaps, and incentivise all public sector health workers by waiving income taxes on their salaries. The government also committed to paying an additional 50% base salary bonus to front-line health workers, as well as ensuring health worker protection through the provision of personal protective equipment (PPEs), training on infection prevention and control and a life insurance cover of up to GHS350,000 (approximately US$60,345) per front-line health worker against COVID-19 infection and death.17

To quantify these HWF investments in the context of the COVID-19 pandemic response, this paper estimates the overall cost of the new recruitments and incentives given to front-line health workers. This paper also presents lessons that would guide HWF planning in future health emergencies and inform country efforts in building health systems resilience.

As part of a larger work on the impact of COVID-19 on the HWF in Ghana, we reviewed relevant health policy/strategic documents to gain contextual insights. We also sought clarifications from the National Response Coordination and Case Management Authority for COVID-19 in Ghana, Heads of the Human Resources for Health Directorates of the Ministry of Health and Ghana Health Service, Heads of Case Management Facilities and HWF planners at the Ghana Health Service on the official data regarding the unit cost of the announced benefit and number of health workers that were involved or affected. Data on the additional recruitments for COVID-19 response were obtained from the online recruitment portal used by the Ministry of Health and Ghana Health Service, which was corroborated with documents of the recruitment approval from the Ministry of Finance (financial clearance). The summary from these sources was validated by the Directors of Human Resources and the Director-General of the Ghana Health Service, who jointly coordinated and oversaw the recruitment and deployment processes.

We calculated the annual cost of remuneration of the additional recruitment as a sum-product of the new recruitments, their corresponding basic salary and market premium (allowances paid to the health workers) (table 1). We also estimated the cost of the financial incentives as the sum of the product of the number that benefited from the incentive(s) and the monetary value of the incentive(s) (see table 2).

### ADDITIONAL HWF RECRUITMENTS AND THE ASSOCIATED ANNUAL COST OF REMUNERATION

Data available from the Ministry of Health recruitment portal,18 the Ministry of Finance statements19 and Ghana Health Service reports show that up to the end of June 2020, the public sector recruited a total of 34,382 permanent staff of various categories. These included 24,285 health professionals between March and June 2020 and an additional 10,097 graduate unemployed nurses and midwives (both public and privately trained) in June 2020. Additionally, there were 1000 temporary recruitments of Contact Tracers between April and June 2020. Furthermore, between July and November 2020, an additional 9,725 health workers of various categories were recruited, bringing the total permanent recruitment into the public health sector to 44,107 and the overall recruitment to 45,107, as shown in table 1.18 20 Compared with a total of 127,101 public sector health workers in 2019,21 the aforementioned additional recruitment represented a 35% boost in the public sector HWF capacity to respond to the COVID-19 pandemic.

About 80% of the permanent recruitments were the nursing and midwifery cadres (40% nurse associates, 30% professional nurses and 6% midwives). Medical and pathological laboratory technicians (biomedical scientists, laboratory technicians and assistants) were nearly 3% of the total recruitments (n=1236) while general medical
| Type of recruitment | Occupation                  | No of additional public sector recruitment (A) | Annual basic salary (B) | Annual market premium (C) | Estimated annual cost of remuneration (GHS) (TAR=A x (B+C)) | Estimated annual cost of remuneration (US$) |
|---------------------|-----------------------------|-----------------------------------------------|-------------------------|---------------------------|----------------------------------------------------------|------------------------------------------|
| Permanent employment| Accountant                  | 182                                           | 24951.62                | 6312.23                   | 5 690 019.79                                              | 981 037.89                               |
|                     | Accounts officer            | 8                                             | 12713.37                | 1147.88                   | 110 889.97                                               | 191 118.96                               |
|                     | Administrative manager      | 321                                           | 24951.62                | 6312.23                   | 10 035 694.25                                            | 1 730 292.11                             |
|                     | Artisan                     | 12                                            | 12713.37                | 1147.88                   | 166 334.96                                               | 28 678.44                                |
|                     | Audiologist                 | 5                                             | 28076.66                | 7741.47                   | 179 090.64                                               | 30 877.70                                |
|                     | Biomedical engineer         | 1                                             | 28076.66                | 7741.47                   | 35 181.13                                                | 6 175.54                                 |
|                     | Biomedical scientist        | 856                                           | 28076.66                | 7741.47                   | 30 660 318.25                                            | 5 286 261.77                             |
|                     | Biostatistics assistant     | 37                                            | 12713.37                | 1147.88                   | 512 866.12                                               | 88 425.19                                |
|                     | Biostatistics officer       | 203                                           | 24951.62                | 6312.23                   | 6 346 560.54                                             | 1 094 234.58                             |
|                     | Catering officer            | 4                                             | 18113.43                | 2002.10                   | 80 462.14                                                | 13 872.78                                |
|                     | Clinical engineering manager| 2                                             | 28076.66                | 7741.47                   | 71 636.26                                                | 12 351.08                                |
|                     | Community health nurse      | 8013                                          | 14305.64                | 6879.82                   | 169 759 053.27                                           | 29 268 802.29                           |
|                     | Community mental health officer | 7                                      | 20382.02                | 2178.17                   | 157 921.32                                               | 27 227.81                                |
|                     | Dental clinic assistant     | 4                                             | 14305.64                | 4994.35                   | 77 199.94                                                | 133 103.33                               |
|                     | Dietician                   | 52                                            | 28076.66                | 13276.81                  | 2 150 380.69                                             | 370 755.29                               |
|                     | Dispensing Assistant        | 382                                           | 14305.64                | 4994.35                   | 7 372 594.35                                             | 1 271 136.96                             |
|                     | Driver                      | 11                                            | 8923.20                 | 636.30                    | 105 154.50                                               | 18 130.09                                |
|                     | Electrical engineering manager | 1 | 28076.66                | 7741.47                   | 35 181.13                                                | 6 175.54                                 |
|                     | Enrolled nurse              | 9883                                          | 14305.64                | 6879.82                   | 209 375 854.67                                           | 36 099 285.29                           |
|                     | Environmental health assistant | 4          | 14305.64                | 6879.82                   | 84 741.82                                                | 14 610.66                                |
|                     | Environmental health officer | 3       | 18113.43                | 1291.64                   | 58 215.21                                                | 10 037.11                                |
|                     | Estate manager              | 5                                             | 24951.62                | 6312.23                   | 156 319.23                                               | 26 951.59                                |
|                     | Executive officer           | 79                                            | 18113.43                | 2002.10                   | 1 589 127.19                                             | 27 397.45                                |
|                     | Field technician            | 530                                           | 14305.64                | 5433.55                   | 10 461 768.40                                            | 1 803 753.17                             |
|                     | Finance officer             | 97                                            | 20382.02                | 2178.17                   | 218 338.24                                               | 377 299.70                               |
|                     | Health assistant            | 4                                             | 12713.37                | 4828.77                   | 70 168.57                                                | 12 098.03                                |
|                     | Health educator             | 27                                            | 24951.62                | 6312.23                   | 844 123.82                                               | 145 538.59                               |
|                     | Health planner              | 15                                            | 24951.62                | 6312.23                   | 468 957.68                                               | 80 854.77                                |
|                     | Health research officer     | 9                                             | 24951.62                | 6312.23                   | 281 374.61                                               | 48 512.86                                |
|                     | Healthservice administrator | 2                                             | 24951.62                | 6312.23                   | 62 527.69                                                | 10 780.64                                |
|                     | Hospital orderly            | 27                                            | 8923.20                 | 3389.20                   | 332 434.72                                               | 57 316.33                                |
|                     | Hospitality manager         | 1                                             | 24951.62                | 6312.23                   | 31 263.85                                                | 5390.32                                  |
|                     | Human resource manager      | 34                                            | 24951.62                | 6312.23                   | 1 062 970.73                                             | 183 270.82                               |
|                     | Internal auditor            | 9                                             | 24951.62                | 6312.23                   | 281 374.61                                               | 48 512.86                                |
|                     | IT manager                  | 8                                             | 27607.33                | 3937.28                   | 252 356.85                                               | 43 509.80                                |
|                     | Laboratory assistant        | 170                                           | 12713.37                | 4994.35                   | 3 010 311.58                                             | 519 019.24                               |
|                     | Laboratory technician       | 210                                           | 20382.02                | 3505.41                   | 5 016 360.26                                             | 86 889.70                                |
|                     | Mechanical engineer         | 2                                             | 24951.62                | 6312.23                   | 62 527.69                                                | 10 780.64                                |
|                     | Medical officer             | 967                                           | 42077.34                | 41167.08                  | 80 497 354.14                                            | 13 878 854.16                            |
|                     | Medical physicist           | 11                                            | 20382.02                | 7741.47                   | 309 358.38                                               | 53 337.65                                |
|                     | Midwifery office            | 201                                           | 28076.66                | 7741.47                   | 7 199 443.89                                             | 1 241 283.43                             |
|                     | Nursing officer             | 4708                                          | 28076.66                | 7741.47                   | 168 631 750.39                                           | 29 074 439.72                            |
|                     | Nutrition officer           | 648                                           | 28076.66                | 14879.19                  | 27 835 390.15                                            | 4 799 205.20                             |

Continued
practitioners (medical officers) were 2% (n=967) and physician assistants were 1.34% (n=606). As only aggregate was made available for this analysis, we had a limitation of not being able to disaggregate by gender and geographical distribution of their deployment. Table 1 summarises the public sector recruitments from March to November 2020 by type, category, numbers and cost implications.

As shown in table 1, we conservatively estimate that the additional public sector recruitments increased the recurrent public health sector wage bill by about GHS103 229 420 (US$17 798 176) per month, translating into almost GHS1.24 billion (US$213.58 million) per annum. These costs, however, exclude other government HWF incentives such as the income tax waiver and 50% frontline health worker salary allowance (see next section), cost of PPE and COVID-19-related pieces of training for health workers.

**ESTIMATED COST OF FINANCIAL INCENTIVES GIVEN TO HEALTH WORKERS**

To incentivise the HWF, the government announced a waiver of personal income taxes for all health workers in the public sector from April to December 2020 and offered a 50% additional allowance to some 10 001 frontline health workers. Due to difficulties in ascertaining the exact number of persons who benefited from the income tax waivers, we undertook a conservative estimation by limiting our analysis to the cost of tax waivers and the additional 50% basic salary given to only frontline health workers for which data were readily available. For the purpose of administering the COVID-19 response

| Type of recruitment | Occupation | No of additional public sector recruitment (A) | Annual basic salary (B) | Annual market premium (C) | Estimated annual cost of remuneration (GHS) (TAR=A x (B+C)) | Estimated annual cost of remuneration (US$) |
|---------------------|------------|-----------------------------------------------|-------------------------|--------------------------|----------------------------------------------------------|------------------------------------------|
| Occupational therapist | 10         | 28076.66                                      | 14879.19                | 429558.49                | 74 061.81                                                |                                          |
| Optician            | 13         | 20382.02                                      | 8422.25                 | 374455.50                | 64 561.29                                                |                                          |
| Optometrist         | 65         | 28076.66                                      | 7741.47                 | 2 328 178.37             | 401 410.06                                               |                                          |
| Pharmacist          | 229        | 30035.11                                      | 35973.47                | 15115 964.36             | 2 606 200.75                                             |                                          |
| Pharmacy technician | 5          | 30035.11                                      | 8422.25                 | 192 286.80               | 33 152.90                                                |                                          |
| Physician assistant | 606        | 28076.66                                      | 17 168.30               | 27 418 442.73            | 4 727 317.71                                             |                                          |
| Physiotherapist     | 56         | 28076.66                                      | 14879.19                | 2 405 527.54             | 414 746.13                                               |                                          |
| Physiotherapy assistant | 237      | 14 305.64                                     | 5433.55                 | 4 678 187.00             | 806 583.97                                               |                                          |
| Procurement manager | 17         | 24 951.62                                     | 6312.23                 | 531 485.37               | 91 635.41                                                |                                          |
| Public health officer | 60       | 28076.66                                      | 7741.47                 | 2 149 087.73             | 370 532.37                                               |                                          |
| Quantity surveyor   | 2          | 24 951.62                                     | 6312.23                 | 62 527.69                | 10 780.64                                                |                                          |
| Radiographer        | 55         | 28076.66                                      | 7741.47                 | 1 969 997.08             | 339 654.67                                               |                                          |
| Receptionist        | 1          | 8923.20                                       | 636.30                  | 9559.50                  | 1648.19                                                  |                                          |
| Records assistant   | 453        | 7047.37                                       | 636.30                  | 3 480 702.51             | 600 121.12                                               |                                          |
| Registered Dent. Surgery Assistant | 229 | 20 382.02                                     | 5619.86                 | 5 954 430.02             | 1 026 625.86                                             |                                          |
| Security guard      | 6          | 13 831.38                                     | 1248.82                 | 90 481.20                | 15 600.21                                                |                                          |
| Sonographer         | 48         | 28076.66                                      | 7741.47                 | 1 719 270.18             | 296 425.89                                               |                                          |
| Staff cook          | 2          | 28076.66                                      | 1147.88                 | 58 449.07                | 10 077.43                                                |                                          |
| Staff midwife       | 2884       | 22 174.41                                     | 11 951.07               | 98 417 888.86            | 16 968 601.53                                            |                                          |
| Staff nurse         | 8929       | 22 174.41                                     | 6114.07                 | 252 587 798.28           | 43 549 620.39                                            |                                          |
| Statistician        | 15         | 24 951.62                                     | 6312.23                 | 468 957.68               | 80 854.77                                                |                                          |
| Stenographer secretary | 1         | 18 113.43                                     | 1291.64                 | 19 405.07                | 3345.70                                                  |                                          |
| Supply officer      | 42         | 18 113.43                                     | 1291.64                 | 815 012.98               | 140 519.48                                               |                                          |
| Technical Officer   | 2364       | 20 382.02                                     | 5619.86                 | 61 486 439.12            | 10 598 006.74                                            |                                          |
| Technician          | 14         | 12 713.37                                     | 4438.46                 | 240 125.56               | 41 000.96                                                |                                          |
| Technologist        | 9          | 22 174.41                                     | 6114.07                 | 254 596.28               | 43 895.91                                                |                                          |
| Temporary employment | Contract tracers | 1000                       | 1800.00                                 | 1 800 000.00             | 310 344.83                                               |                                          |
| Overall             | 45 107     | 1 506 964.98                                  | 478 641.02              | 1 238 753 042.53         | 213 578 110.78                                           |                                          |

Bank of Ghana exchange rate used: US$1 =GH¢5.8, year=2020.

TAR, Total Annual Remuneration cost.
Table 2  Financial incentives for front-line health workers for COVID-19 response, April–December 2020

| Health workers by ISCO-08 classification | No of health workers who benefited (A) | Average monthly salary in US$ (B) | Income tax waiver per month in US$ (C) | Front-line COVID-19 response allowance (50% of Basic Salary) in US$ (D=50% x B) | Monthly incentive per staff in US$ (E=C+D) | Total monthly financial incentive US$ (F=E x A) | Total cost from April - December 2020 |
|------------------------------------------|----------------------------------------|----------------------------------|--------------------------------------|------------------------------------------|--------------------------------------|------------------------------------------|---------------------------------------|
| 2269: Health professionals not elsewhere classified | 70 | 300 | 36 | 150 | 186 | 13 054 | 156 643 |
| 1211: Administration manager | 23 | 469 | 64 | 235 | 299 | 6871 | 82 447 |
| 1212: Human resource manager | 7 | 435 | 59 | 218 | 276 | 1934 | 23 209 |
| 1219: Estates manager | 13 | 410 | 54 | 205 | 259 | 3370 | 40 440 |
| 1219: Estates officer | 3 | 338 | 43 | 169 | 212 | 635 | 7617 |
| 133: IT manager | 3 | 495 | 69 | 247 | 316 | 948 | 11 373 |
| 1342: Health service manager | 137 | 762 | 121 | 381 | 502 | 68 790 | 825 485 |
| 1420: Storekeeper | 137 | 762 | 121 | 381 | 502 | 68 790 | 825 485 |
| 2211: General medical practitioner | 245 | 496 | 69 | 248 | 317 | 77 663 | 931 951 |
| 2212: Specialist medical practitioner | 68 | 1471 | 288 | 735 | 1024 | 69 623 | 835 478 |
| 2221: Anaesthetist | 2 | 1423 | 277 | 711 | 989 | 1977 | 23 724 |
| 2222: Professional nurse | 2287 | 559 | 79 | 280 | 359 | 820 461 | 9 845 535 |
| 2222: Professional midwife | 842 | 639 | 92 | 319 | 412 | 346 719 | 4 160 625 |
| 2261: Dental practitioner | 27 | 364 | 47 | 182 | 229 | 6186 | 74 232 |
| 2262: Pharmacist total | 45 | 843 | 140 | 422 | 562 | 25 286 | 303 426 |
| 2263: Environmental and occupational health and hygiene professionals | 1410 | 429 | 58 | 215 | 272 | 383 929 | 4 607 147 |
| 2264: Physiotherapist | 48 | 523 | 73 | 261 | 335 | 16 056 | 192 678 |
| 2265: Dietician | 35 | 560 | 79 | 280 | 359 | 12 572 | 150 860 |
| 2265: Nutritionist | 35 | 807 | 132 | 404 | 535 | 18 739 | 224 868 |
| 2265: Public health nutritionist | 97 | 467 | 64 | 234 | 297 | 28 855 | 346 255 |
| 2411: Accountant | 20 | 510 | 71 | 255 | 326 | 6527 | 78 319 |
| 2634: Clinical psychologist | 27 | 575 | 82 | 287 | 369 | 9 965 | 119 579 |
| 3115: Mechanical and clinical engineering technician | 38 | 515 | 72 | 257 | 329 | 12 505 | 150 065 |
| 3122: Foreman | 33 | 279 | 33 | 139 | 172 | 5682 | 68 179 |
| 3212: Medical and pathology laboratory technicians | 465 | 439 | 59 | 219 | 279 | 129 577 | 1 554 923 |
| 3212: Medical and pharmaceutical technician | 65 | 494 | 68 | 247 | 315 | 20 491 | 245 887 |
| 3212: Mortuary man | 53 | 174 | 15 | 87 | 102 | 5422 | 65 069 |
| 3212: Technician, blood bank | 12 | 752 | 119 | 376 | 495 | 5937 | 71 240 |
| 3214: Medical and pathology laboratory technicians | 75 | 384 | 50 | 192 | 242 | 18 163 | 217 953 |
| 3231: Nurse associate | 2293 | 322 | 40 | 161 | 201 | 460 572 | 5 526 864 |

Continued
incentives, the Ministry of Health defined front-line health workers as ‘any health worker(s) directly involved in triaging, isolation, laboratory testing, ambulance service, holding centres, treatment centres, surveillance and contact tracing for COVID-19’. With this definition, the ministry vetted health workers’ claims, and by the end of December 2020, the Ministry of Health indicated that 10,001 health workers qualified and were receiving the 50% top-up allowance. Professional nurses and nurse associates (enrolled nurses and community health nurses) cumulatively made up almost 46% of the front-line health workers, while the environmental and occupational health and hygiene professionals comprised some 14%, and general medical practitioners and specialist medical practitioners together composed 3.15%. As demonstrated in Table 2, we estimate that the Government of Ghana spent about GH 16.93 million (equivalent to US$2.92 million) monthly as COVID-19 response incentives to the defined 10,001 front-line health workers, which translates into some US$35 million by the end of 2020.

SUMMARY COST ESTIMATES OF GHANA’S HWF RECRUITMENTS AND INCENTIVES
Conservatively, Ghana spent at least US$213.6 million within the first year of the COVID-19 pandemic on HWF recruitment and incentives (Table 3). This estimate, however, excludes expenditures on PPEs and training of health workers on case management and public

### Table 2

Continued

| Health workers by ISCO-08 classification | No of health workers who benefited (A) | Average monthly salary in US$ (B) | Income tax waiver per month in US$ (C) | Front-line COVID-19 response allowance (50% of Basic Salary in US$ (D=50% x B)) | Monthly incentive per staff in US$ (E=C+D) | Total monthly financial incentive US$ (F=E x A) | Total cost from April - December 2020 |
|-----------------------------------------|---------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------------|------------------------------------------|------------------------------------------|-------------------------------------|
| 3231: Pharmaceutical technician and assistant | 270 | 439 | 59 | 220 | 279 | 75,346 | 904,154 |
| 3252: Medical records and health information technicians | 477 | 398 | 53 | 199 | 252 | 120,085 | 1,441,017 |
| 3258: Emergency medical technician | 45 | 279 | 33 | 139 | 172 | 77,43 | 92,912 |
| 3343: Administrative secretary | 42 | 279 | 33 | 139 | 172 | 72,31 | 86,774 |
| 4131: Typist | 32 | 196 | 19 | 98 | 117 | 37,40 | 44,878 |
| 4311: Accounting clerk | 28 | 208 | 21 | 104 | 125 | 3501 | 42,010 |
| 5133: Nursing aid | 30 | 256 | 29 | 128 | 157 | 4708 | 56,495 |
| 5329: Hospital orderly | 152 | 195 | 19 | 97 | 116 | 17,679 | 212,149 |
| 5414: Security guard | 98 | 203 | 20 | 101 | 122 | 11,916 | 142,990 |
| 833: Heavy truck and bus driver | 212 | 155 | 12 | 78 | 90 | 19,042 | 228,502 |
| **Total** | **10001** | **19605** | **2872** | **9602** | **12674** | **2918286** | **35019438** |

Bank of Ghana exchange rate used: US$1=GHS5.8, year=2020.
Data sources: Ghana Health Service; Integrated personnel Payroll Database, Controller and Accountant General’s Department.

### Table 3

Cost of COVID-19 HWF recruitments and incentives compared with the 2019 health sector wage bill

| Description | Annual cost | As a % of the 2019 wage bill |
|-------------|-------------|-------------------------------|
| Overall health sector HWF Wage Bill in 2019 (GHc) | 3,930,985,239 |
| Overall health sector HWF Wage Bill in 2019 (USD) | 677,756,076 |
| 50% allowance +Income Tax Waiver (USD) | 350,194,38 |
| Estimated annual wage bill cost of new recruitments (USD) | 213,578,11 |
| Overall COVID-19 HWF investment (recruitments and incentives) | 248,597,549 |

Data sources: Ghana Health Service; Integrated personnel Payroll Database, Controller and Accountant General’s Department. HWF, health workforce.
health response measures to the pandemic. The new recruitments are estimated to have increased the health sector wage bill by 32% compared with the 2019 wage bill. However, the much publicised and talked about incentives granted to health workers, particularly those defined as front-line health workers, represented only 5.2% of the additional cost compared with the 2019 wage bill. Reports from the Ministry of Finance show that 47% of the sector budget came from Government of Ghana (GoG) sources, while the remaining 53% were sourced from internally generated funds of health facilities (24%) and 29% from development partners and donors.\(^{19,20}\)

**LESSONS FOR HWF PLANNING IN FUTURE HEALTH EMERGENCIES**

Ghana invested considerably in HWF recruitment and incentives to respond to the COVID-19 pandemic, resulting in an almost 37% increase in the public sector wage bill. A recent study suggests that Ghanaian health workers felt more satisfied and appreciated compared with their Kenyan counterparts.\(^{24}\) Although the level of satisfaction of the Ghanaian health workers has not been empirically linked to the incentives given to fight the COVID-19 pandemic, it could be one of the hypotheses for further research. Also, while the impact of the incentives granted the Ghanaian health workers on the overall success or otherwise of the pandemic response in the country is yet to be ascertained, an important takeaway for the global health community is that incentives can play an essential part in mobilising the HWF for emergency response.

Furthermore, Ghana significantly increased its public sector HWF capacity by recruiting 45,107 health workers (including 10,000 temporary contact tracers), which represents an increase of 35.5% of the overall public sector HWF at prepandemic levels. Although this appears commendable, it also underlines the magnitude of the pre-pandemic levels of HWF unemployment in the country, a phenomenon that is well documented.\(^{10,25,26}\)

From a HWF perspective, although the pandemic posed the most significant challenge in several decades, it also provided public sector employment opportunities for health workers who would have otherwise remained unemployed for a while. This observation is not limited to Ghana; similar recruitment of more than 45,000 volunteers, retirees and unemployed health workers was reported in Ethiopia.\(^{27}\) Thus, HWF planners and policymakers should heighten advocacy for strengthening investments in decent employment, protection and safety for the HWF using the various resources being availed to the health sector to fight COVID-19, which the lessons could be helpful for addressing future pandemics.

**CONCLUSION**

Responding to the COVID-19 pandemic, as well as other public health emergencies, requires a tailored investment in the HWF to ensure the availability of skilled and motivated health workers. Strategies need to be developed and implemented towards improving health systems’ resilience rather than short-term measures to mitigate the impact of the emergencies. In this Ghana’s instance, investments were tailored to holistically improve health systems performance and resilience by recruiting qualified health workers who were previously unemployed. Additionally, incentives were provided to the health workers to motivate the health workers. Incentives do play an essential role in mobilising the HWF needed for public health emergency response. Obtaining and sustaining investment in the HWF requires sustained advocacy by HWF planners and policymakers. The advocacy should focus on the need for decent employment and protection and safety for the HWF as a means of achieving health systems resilience.

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