


Cost analysis of health workforce investments for COVID-19 response in Ghana

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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 recruitments 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 GHS103 229 420 (US\$17 798 176) per month, and about GHS1.24 billion (US\$213.58 million) 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 GHS16.93 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.¹ 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.^{1 2} It also increased the workload

SUMMARY BOX

- ⇒ The COVID-19 pandemic had multiple adverse impacts on the health workforce, including infections and mortalities, violence and harassment, discrimination, burn-out and mental disorders, which have contributed to reducing the availability of the health workforce and the weakening of the health systems' capacity to respond to the pandemic.
- ⇒ Lessons from Ghana show that responding to the COVID-19 pandemic requires a tailored investment in the health workforce to ensure the availability of skilled and motivated health workers.
- ⇒ Ghana's example highlights that providing incentives to health workers can play an essential role in mobilising the health workforce needed for public health emergency response.
- ⇒ There is a need for health workforce planners and policy-makers to heighten advocacy for strengthening investments in decent employment, protection and safety for the health workforce as a means to achieving health systems resilience.

and psychosocial stress, which adversely impacted the well-being of health workers.³ 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.⁴ 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.⁵⁻⁸ For



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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 10000 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 10000 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, 133 746), as recorded at the end of October 2020 (GHS, 2020). As the pandemic unfolded, there were guidelines^{14 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 9725 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

Table 1 Summary of additional recruitment by category, number and cost, March–November 2020

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	24 951.62	6312.23	5 690 019.79	981 037.89
	Accounts officer	8	12 713.37	1147.88	110 889.97	19 118.96
	Administrative manager	321	24 951.62	6312.23	10 035 694.25	1 730 292.11
	Artisan	12	12 713.37	1147.88	166 334.96	28 678.44
	Audiologist	5	28 076.66	7741.47	179 090.64	30 877.70
	Biomedical engineer	1	28 076.66	7741.47	35 818.13	6175.54
	Biomedical scientist	856	28 076.66	7741.47	30 660 318.25	5 286 261.77
	Biostatistics assistant	37	12 713.37	1147.88	512 866.12	88 425.19
	Biostatistics officer	203	24 951.62	6312.23	6 346 560.54	1 094 234.58
	Catering officer	4	18 113.43	2002.10	80 462.14	13 872.78
	Clinical engineering manager	2	28 076.66	7741.47	71 636.26	12 351.08
	Community health nurse	8013	14 305.64	6879.82	169 759 053.27	29 268 802.29
	Community mental health officer	7	20 382.02	2178.17	157 921.32	27 227.81
	Dental clinic assistant	4	14 305.64	4994.35	77 199.94	13 310.33
	Dietician	52	28 076.66	13 276.81	2 150 380.69	370 755.29
	Dispensing Assistant	382	14 305.64	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	28 076.66	7741.47	35 818.13	6175.54
	Enrolled nurse	9883	14 305.64	6879.82	209 375 854.67	36 099 285.29
	Environmental health assistant	4	14 305.64	6879.82	84 741.82	14 610.66
	Environmental health officer	3	18 113.43	1291.64	58 215.21	10 037.11
	Estate manager	5	24 951.62	6312.23	156 319.23	26 951.59
	Executive officer	79	18 113.43	2002.10	1 589 127.19	273 987.45
	Field technician	530	14 305.64	5433.55	10 461 768.40	1 803 753.17
	Finance officer	97	20 382.02	2178.17	2188 338.24	377 299.70
	Health assistant	4	12 713.37	4828.77	70 168.57	12 098.03
	Health educator	27	24 951.62	6312.23	844 123.82	145 538.59
	Health planner	15	24 951.62	6312.23	468 957.68	80 854.77
	Health research officer	9	24 951.62	6312.23	281 374.61	48 512.86
	Healthservice administrator	2	24 951.62	6312.23	62 527.69	10 780.64
	Hospital orderly	27	8923.20	3389.20	332 434.72	57 316.33
	Hospitality manager	1	24 951.62	6312.23	31 263.85	5390.32
	Human resource manager	34	24 951.62	6312.23	1,062,970.73	183 270.82
	Internal auditor	9	24 951.62	6312.23	281 374.61	48 512.86
	IT manager	8	27 607.33	3937.28	252 356.85	43 509.80
	Laboratory assistant	170	12 713.37	4994.35	3 010 311.58	519 019.24
	Laboratory technician	210	20 382.02	3505.41	5 016 360.26	864 889.70
	Mechanical engineer	2	24 951.62	6312.23	62 527.69	10 780.64
	Medical officer	967	42 077.34	41 167.08	80 497 354.14	13 878 854.16
	Medical physicist	11	20 382.02	7741.47	309 358.38	53 337.65
Midwifery officer	201	28 076.66	7741.47	7 199 443.89	1 241 283.43	
Nursing officer	4708	28 076.66	7741.47	168 631 750.39	29 074 439.72	
Nutrition officer	648	28 076.66	14 879.19	27 835 390.15	4 799 205.20	

Continued

Table 1 Continued

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	28 076.66	14 879.19	429 558.49	74 061.81
	Optician	13	20 382.02	8 422.25	374 455.50	64 561.29
	Optometrist	65	28 076.66	7 741.47	2 328 178.37	401 410.06
	Pharmacist	229	30 035.11	35 973.47	15 115 964.36	2 606 200.75
	Pharmacy technician	5	30 035.11	8 422.25	192 286.80	33 152.90
	Physician assistant	606	28 076.66	17 168.30	27 418 442.73	4 727 317.71
	Physiotherapist	56	28 076.66	14 879.19	2 405 527.54	414 746.13
	Physiotherapy assistant	237	14 305.64	5 433.55	4 678 187.00	806 583.97
	Procurement manager	17	24 951.62	6 312.23	531 485.37	91 635.41
	Public health officer	60	28 076.66	7 741.47	2,149,087.73	370 532.37
	Quantity surveyor	2	24 951.62	6 312.23	62 527.69	10 780.64
	Radiographer	55	28 076.66	7 741.47	1 969 997.08	339 654.67
	Receptionist	1	8 923.20	636.30	9 559.50	1 648.19
	Records assistant	453	7 047.37	636.30	3 480 702.51	600 121.12
	Registered Dent. Surgery Assistant	229	20 382.02	5 619.86	5 954 430.02	1 026 625.86
	Security guard	6	13 831.38	1 248.82	90 481.20	15 600.21
	Sonographer	48	28 076.66	7 741.47	1 719 270.18	296 425.89
	Staff cook	2	28 076.66	1 147.88	58 449.07	10 077.43
	Staff midwife	2 884	22 174.41	11 951.07	98 417 888.86	16 968 601.53
	Staff nurse	8 929	22 174.41	6 114.07	252 587 798.28	43 549 620.39
	Statistician	15	24 951.62	6 312.23	468 957.68	80 854.77
	Stenographer secretary	1	18 113.43	1 291.64	19 405.07	3 345.70
	Supply officer	42	18 113.43	1 291.64	81 501.98	14 051.98
	Technical Officer	2 364	20 382.02	5 619.86	61 468 439.12	10 598 006.74
	Technician	14	12 713.37	4 438.46	240 125.56	41 400.96
	Technologist	9	22 174.41	6 114.07	254 596.28	43 895.91
Temporary employment	Contract tracers	1 000	1 800.00	–	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 =GHC5.8, year=2020.
TAR, Total Annual Remuneration cost.

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% front-line 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 front-line health workers.²² 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 front-line health workers for which data were readily available. For the purpose of administering the COVID-19 response

Table 2 Financial incentives for front-line health workers for COVID-19 response, April–December 2020

Financial incentives for front-line health workers during COVID-19							
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
222: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	9965	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

Table 2 Continued

Health workers by ISCO-08 classification	Financial incentives for front-line health workers during COVID-19						
	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	75346	904154
3252:Medical records and health information technicians	477	398	53	199	252	120085	1441017
3258:Emergency medical technician	45	279	33	139	172	7743	92912
3343: Administrative secretary	42	279	33	139	172	7231	86774
4131: Typist	32	196	19	98	117	3740	44878
4311: Accounts clerk	28	208	21	104	125	3501	42010
5133: Nursing aid	30	256	29	128	157	4708	56495
5329: Hospital orderly	152	195	19	97	116	17679	212149
5414: Security guard	98	203	20	101	122	11916	142990
833: Heavy truck and bus driver	212	155	12	78	90	19042	228502
Total	10001	19605	2872	9802	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.

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'.²³ With this definition, the ministry vetted health workers' claims, and by the end of December 2020, the Ministry of Health indicated that 10001 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 16.93million (equivalent to US\$2.92million) monthly as COVID-19 response incentives to the defined 10001 front-line health workers, which translates into some US\$35million by the end of 2020.

SUMMARY COST ESTIMATES OF GHANA'S HWF RECRUITMENTS AND INCENTIVES

Conservatively, Ghana spent at least US\$213.6million 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 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)	677756076	
50% allowance +Income Tax Waiver (USD)	35019438	5.2
Estimated annual wage bill cost of new recruitments (USD)	213578111	31.5
Overall COVID-19 HWF investment (recruitments and incentives)	248597549	36.7

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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