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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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Supplementary Material

This supplement has been provided by the authors to give readers additional information about their work.

Supplement to: Eric A. Finkelstein, Anirudh Krishnan, Aliya Naheed, Imtiaz Jehan, H. Asita de Silva, Mihir Gandhi, Ching Wee Lim, Nantu Chakma, Dileepa Ediriweera, Jehanzeb Khan, Anuradhani Kasturiratne, Samina Hirani, AKM Solayman, Tazeen H. Jafar, COBRA Study Group. Budget Impact and Cost-Effectiveness of the Multi-Component Hypertension Management Program, COBRA-BPS, in Rural Communities in Bangladesh, Pakistan, and Sri Lanka. *The Lancet Global Health*. (LANGLH-D-20-03204).

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COBRA-BPS Study Group members:

Main PI and country PI: Professor Tazeen H Jafar (overall principal investigator), Dr. Aliya Naheed (site principal investigator - Bangladesh), Dr. Imtiaz Jehan (site principal investigator - Pakistan), Professor Asita de Silva (site principal investigator - Sri Lanka).

Duke-NUS Medical School contributors: Professor Tazeen H Jafar (overall principal investigator, clinician-scientist/health systems trialist), Dr. Mihir Gandhi (biostatistician), Professor Eric Finkelstein (main health economist), Dr. Marcel Bilger (health economist), Dr. Feng Liang (senior research fellow and project manager); Dr. Saeidah Tavajoh (research associate project coordinator), Mr. Lim Ching Wee (research assistant), Mr. Anirudh Krishnan (research assistant), Ms. Cecille Lintag (administrative executive).

Singapore Clinical Research Institute: Dr. Mihir Gandhi (trial statistician), Dr. Pryseley Nkouibert Assam (supporting trial statistician), Mr. Rajesh Babu Moorakonda (statistical analyst), Assistant Professor Lin Xinyi (Cindy) (validation statistician), Associate Professor Edwin Chan (epidemiologist), Mr. Zheng Yiheng (REDCap administrator).

ICDDR, B: Dr. Aliya Naheed (country PI), John D Clemens (country co-I) , Dr. Mohammad Hasnat (country collaborator), Nantu Chakma, Dr. Dewan Alam, Ms. Sonia Pervin, Dr. Ali Tanweer, Dr. Rubhana Rajib, Mr. Mohammad Tauhid ul Islam, Mr. AKM Solyman.

Aga Khan University: Dr. Imtiaz Jehan (country PI), Dr. Aamir Hameed Khan (country co-I), Dr. Sahar Senan, Dr. Hamid Farazdiq, Dr. Gulshan Himani, Dr. Samina Hirani, Dr. Jehanzeb Khan, Dr. Syed Omair Nadeem, Dr. Hunaina Shahab, Ms. Ayesha Khan (consultant).

University of Kelaniya: Professor Asita de Silva (country PI), Dr. Anurhadhani Kasuriratne (co-I), Dr. Nathasha Luke, Dr. Chamini de Silva, Dr. Manuja Perera, Dr. Channa Ranasinha, Dr. Dileepa Ediriweera.

Collaborators: Dr. Helena Legido-Quigley (social scientist), NUS, Singapore, Professor Shah Ebrahim, (epidemiologist) UK, Dr. Elizabeth Turner (validation statistician) USA.

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Coordinating center: Duke-NUS Medical School, Singapore.

Trial steering committee members: Professor Joep Perk (chair), Dr. Richard Smith, Professor Anne Mills, Dr. Elizabeth Allen, Professor Kate Hunt.

Funding agency observer: Ms. Jill Jones, the Medical Research Council, UK.

Data safety & monitoring committee: Professor Andrew Farmer (chair), Professor Doris Young, Professor Bruce Neal, Associate Professor Tan Say Beng.

Supplement A: Scale-up costing methodology

Supplemental Table A1. Key cost components of COBRA-BPS by activity

Activity	Key cost components tracked
Admin and oversight	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Time spent by site–principal investigator, program administrators and program coordinators in planning, coordinating, and monitoring program delivery, including travel time <p><u>Rental:</u></p> <ul style="list-style-type: none"> • Space for planning meetings • Office space for admin staff (site-principal investigator, program administrators and coordinators, but excluding costs for research staff) <p><u>Contracted services:</u></p> <ul style="list-style-type: none"> • Transport for monitoring visits
Training CHWs in blood pressure monitoring and home health education	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Time spent by project staff traveling to training venue and conducting trainings for Community Health Workers (CHWs) in blood pressure monitoring and lifestyle counselling • Per diems paid to contracted trainers • Per diems/compensation paid to CHWs for attending trainings • Includes initial and refresher trainings <p><u>Rental:</u></p> <ul style="list-style-type: none"> • Training space – initial and refresher trainings <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> • Training material: printing of posters, manuals, checklists • Cost of blood pressure monitors <p><u>Contracted services:</u></p> <ul style="list-style-type: none"> • Refreshments provided during trainings • Transportation provided for trainers • Travel reimbursements for CHWs
Training general practitioners	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Time spent by project staff travelling to training venue and conducting trainings for general practitioners • Per diems paid to contracted trainers • Per diems/compensation paid to general practitioners for attending trainings • Includes initial and refresher trainings <p><u>Rental:</u></p> <ul style="list-style-type: none"> • Training space – initial and refresher trainings <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> • Training material: printing of posters, manuals, checklists • Cost of blood pressure monitors <p><u>Contracted services:</u></p> <ul style="list-style-type: none"> • Refreshments provided during trainings • Transportation provided for trainers • Travel reimbursements for general practitioners
Implementation of blood pressure monitoring and home health education	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Time spent by CHWs travelling to households with hypertensive patients, monitoring blood pressure, delivering home health education, and maintaining participant logs <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> • Printing of checklists • Cost of blood pressure monitors <p><u>Contracted services:</u></p> <ul style="list-style-type: none"> • Costs of travel to households with hypertensive patients
Coordination at hypertension triage counters	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Time spent by hypertension care coordinators, nurses staffing the hypertension triage counters in verifying and tallying CHW, general practitioner referral, and general practitioner management checklists and measuring blood pressure <p><u>Rental:</u></p> <ul style="list-style-type: none"> • Space for hypertension triage counters <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> • Equipment used in setting up the triage counter • Printing of posters, checklists • Blood pressure monitors
Medical visits	<p><u>Labor:</u></p> <ul style="list-style-type: none"> • Consultation time spent by general practitioners attending to hypertensive patients • Costs of clinic staff time • Time spent in identifying eligible poor hypertensives, providing travel vouchers, and ensuring free supply of antihypertensive medication <p><u>Rental:</u></p> <ul style="list-style-type: none"> • Space for general practitioner office and/or consultation rooms <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> • Blood pressure monitors

	<ul style="list-style-type: none"> Market cost of antihypertensive medication (unsubsidized) given to all hypertensives in the intervention clusters
Coordinating activities of CHW supervisors	<p><u>Labor:</u></p> <ul style="list-style-type: none"> Time spent by CHW supervisors visiting homes, reviewing checklists, and maintaining log of hypertensive patients <p><u>Materials and supplies:</u></p> <ul style="list-style-type: none"> Cost of blood pressure monitors <p><u>Contracted services:</u></p> <ul style="list-style-type: none"> Transport for home visits, fidelity tracking activities

Supplemental Table A2. Scale-up cost estimation methodology*

Cost categories in scale-up model		
	Year 1	Years 2–3
Admin / Oversight	<ul style="list-style-type: none"> Oversight is provided by 0-3 full-time national program administrator, 0-3 full-time provincial/state administrator for each province/state, one 0-3 full-time equivalent program coordinator for each district, and one 0-2 full-time equivalent CHW supervisor per primary health care center Monthly salaries and compensations are applied based on market rates 	<ul style="list-style-type: none"> Same as Year 1
Training CHWs in standardized blood pressure monitoring and home health education	<ul style="list-style-type: none"> One cycle of training of trainers would be conducted at each district One CHW training cycle would be conducted at each division (sub-district) in Pakistan and Sri Lanka; five cycles at each upazila (sub-district) in Bangladesh Rental and trainer-related costs from cost reports are multiplied by the number of training cycles required Trainee-related costs from cost reports (per diems, refreshments, etc.) are multiplied by the total number of trainees in the country 	<ul style="list-style-type: none"> Training costs assumed to decrease by 50% in subsequent years – approximately two refresher trainings for master trainers and two refresher trainings for CHWs annually
Training general practitioners	<ul style="list-style-type: none"> General practitioner training cycles would be conducted thrice in each district to ensure all general practitioners are reached Rental and trainer-related costs from cost reports are multiplied by the number of training cycles required (thrice the number of public sector general practitioners in the country) Trainee-related costs from cost reports (per diems, refreshments, etc.) are multiplied by the number of public sector general practitioners in the country 	<ul style="list-style-type: none"> Training costs assumed to decrease by 50% in subsequent years – approximately two refresher trainings for each general practitioner annually As with year 1, trainings would be conducted thrice in each district to cover all general practitioners
CHW travel to households	<ul style="list-style-type: none"> CHWs visit every household once at the start of COBRA-BPS and measure blood pressure of eligible adults to identify hypertensives Costs are estimated for the share of the country's rural areas that are covered by some existing CHW activities – 100% in Bangladesh and Sri Lanka; 60% in Pakistan <u>Sri Lanka:</u> 60% of households are visited 4 times a year for routine CHW activities and incur no additional travel costs beyond 10 minutes per household of time to travel by foot between households. CHW time costs are based on salaries reported within trial. <u>Bangladesh and Pakistan:</u> 100% of households in these areas are already being visited at least 4 times a year by CHWs and therefore require no incremental travel cost 	<ul style="list-style-type: none"> CHWs would visit all houses once a year to measure the blood pressure of normotensives and pre-hypertensives aged 40 or greater to identify new cases of hypertension No. of households increased by national population growth rate
Standardized blood pressure monitoring by CHWs	<ul style="list-style-type: none"> CHWs monitor blood pressure of all individuals once a year, and of eligible hypertensives an additional 3 times a year Each CHW is provided a blood pressure monitor CHWs spend 10 minutes per individual taking 3 blood pressure measurements A part of 20% of CHWs' salary being is paid as stipends in Bangladesh and Pakistan 	<ul style="list-style-type: none"> CHWs monitor blood pressure of all individuals once a year, and of previously or newly identified hypertensives an additional 3 times a year Screened population increased by national population growth rate 50% of instruments would require annual replacement

Home health education	<ul style="list-style-type: none"> • CHWs deliver home health education four times a year in households in which a hypertensive member is identified • Each session lasts an average of 50 minutes • A part of 20% of CHWs' salary being is paid as stipends in Bangladesh and Pakistan 	<ul style="list-style-type: none"> • CHWs deliver home health education four times a year in households consisting of at least 1 previously or newly identified hypertensive • Eligible population increased by national population growth rate and annual hypertension incidence of 8.26% in COBRA-BPS scenario
Coordination at hypertension triage counter	<ul style="list-style-type: none"> • Hypertension triage counters are set up at each primary health care center • Coordination and setup costs per cluster from cost reports are multiplied by number of primary health care centers 	<ul style="list-style-type: none"> • Per-cluster costs from cost reports in year 2 of the trial are multiplied by number of primary health care centers to project scale-up costs in Years 2 and 3
Medication subsidies	<ul style="list-style-type: none"> • Self-reported blood pressure medication use was obtained from participant surveys in intervention clusters relative to usual care clusters • Public plus private sector cost per participant of incremental medication is imputed using market rate^{S1-S3} for medication in Bangladesh, Pakistan, and Sri Lanka for cost-effectiveness analysis. • Public sector cost per participant of incremental medication is imputed using market rate^{S3} for medication in Sri Lanka multiplied by government subsidies of 63% for budget impact analysis. Governments in Bangladesh and Pakistan do not pay for blood pressure medications. 	<ul style="list-style-type: none"> • Eligible population is increased by national population growth rate • Differences in blood pressure medication use via changes in dosage is assumed to remain constant • Incremental number of participants requiring medication is adjusted for an annual incidence of hypertension of 8.26% • Per-participant incremental costs in year 2 of the trial are multiplied by number of participants in Years 2 and 3 of the scale-up

**All costs were tracked in 2017 local currency units and converted to U.S. dollars using the exchange rate as of 13 May 2019 (US\$1 = BDT 84.40 = PKR 141.62 = LKR 176.64) and inflated to 2020 dollars using a seasonally adjusted urban U.S. consumer price index (CPI) inflation rate.^{S4, S5}*

Supplement B: Results –budget impact: incremental costs, by country

Supplemental Table B1a. Budget impact in Bangladesh in years 1–3 from the health ministry perspective (all monetary values in 2020 US\$, absolute costs rounded to nearest \$10, costs in two decimal places rounded to nearest \$0.01)

Cost Type	Year 1	Year 2	Year 3
Admin / Oversight (US\$)	806,230	806,230	806,230
Training (US\$)			
CHWs (standardized blood pressure monitoring and home health education)	44,540,960	22,270,480	22,270,480
General practitioners	1,206,760	603,380	603,380
Implementation (US\$)			
CHW travel to households	-	-	-
Standardized blood pressure monitoring by CHWs	29,578,480	19,730,430	20,467,310
Home health education	26,496,410	30,519,610	34,140,110
Coordination at hypertension triage counter	364,490	364,490	364,490
Medication subsidies	-	-	-
Total budget impact (US\$)	102,993,340	74,294,630	78,652,010
Eligible population (rural hypertensives aged 40+)	9,671,504	11,391,650	13,009,795
Budget impact per participant (US\$)	10.65	6.52	6.05
Rural population aged 40+	29,131,037	29,422,348	29,716,571
Budget impact per rural 40+ year old (US\$)	3.54	2.53	2.65
Rural population (all ages)	105,622,472	106,678,697	107,745,484
Cost per rural resident (US\$)	0.98	0.70	0.73
Total national population	164,669,751	166,316,449	167,979,613
Cost per capita (US\$)	0.63	0.45	0.47

Supplemental Table B1b. Budget impact in Pakistan in years 1–3 from the health ministry perspective (all monetary values in 2020 US\$, absolute costs rounded to nearest \$10, costs in two decimal places rounded to nearest \$0.01)

Cost Type	Year 1	Year 2	Year 3
Admin / Oversight (US\$)	2,745,460	2,745,460	2,745,460
Training (US\$)			
CHWs (standardized blood pressure monitoring and home health education)	31,351,650	15,675,820	15,675,820
General practitioners	928,780	464,390	464,390
Implementation (US\$)			
CHW travel to households	-	-	-
Standardized blood pressure monitoring by CHWs	13,606,640	9,120,870	9,516,730
Home health education	8,549,980	9,931,290	11,191,680
Coordination at hypertension triage counter	427,560	427,560	427,560
Medication subsidies	-	-	-
Total budget impact (US\$)	57,610,060	38,365,390	40,021,640
Eligible population (rural hypertensives aged 40+)	5,619,670	6,728,994	7,796,449
Budget impact per participant (US\$)	10.25	5.70	5.13
Rural population aged 40+	29,087,321	29,669,068	30,262,449
Budget impact per rural 40+ year old (US\$)	1.98	1.29	1.32
Rural population (all ages)	125,219,401	127,723,789	130,278,265
Cost per rural resident (US\$)	0.46	0.30	0.31
Total national population	197,015,955	200,956,274	204,975,400
Cost per capita (US\$)	0.29	0.19	0.20

Supplemental Table B1c. Budget impact in Sri Lanka in years 1–3 from the health ministry perspective (all monetary values in 2020 US\$, absolute costs rounded to nearest \$10, costs in two decimal places rounded to nearest \$0.01)

Cost Type	Year 1	Year 2	Year 3
Admin / Oversight (US\$)	684,590	684,590	684,590
Training (US\$)			
CHWs (standardized blood pressure monitoring and home health education)	1,119,170	559,580	559,580
General practitioners	233,340	116,670	116,670
Implementation (US\$)			
CHW travel to households	917,010	963,830	1,007,260
Standardized blood pressure monitoring by CHWs	4,039,880	4,041,860	4,255,760
Home health education	8,893,130	9,603,150	10,256,020
Coordination at hypertension triage counter	114,320	114,320	114,320
Medication subsidies	6,005,460	6,591,420	7,146,120
Total budget impact (US\$)	22,006,890	22,675,410	24,140,330
Eligible population (rural hypertensives aged 40+)	3,428,737	3,763,279	4,079,978
Budget impact per participant (US\$)	6.42	6.03	5.92
Rural population aged 40+	6,983,172	7,059,986	7,137,646
Budget impact per rural 40+ year old (US\$)	3.15	3.21	3.38
Rural population (all ages)	17,694,254	17,888,891	18,085,669
Cost per rural resident (US\$)	1.24	1.27	1.33
Total national population	21,444,000	21,679,884	21,918,363
Cost per capita (US\$)	1.03	1.05	1.10

Supplemental Table B2. Incremental cost of COBRA-BPS in Bangladesh (24 years), Pakistan (22 years), and Sri Lanka (21 years) relative to usual care from the health systems perspective (all monetary values in 2020 US\$, absolute costs rounded to nearest \$10, costs in two decimal places rounded to nearest \$0.10)

Cost Type	Bangladesh	Pakistan	Sri Lanka
Admin / Oversight (US\$)	14,063,610	45,066,770	10,869,520
Training (US\$)			
CHWs (standardized blood pressure monitoring and home health education)	410,748,040	272,994,850	9,444,360
General practitioners	11,128,510	8,087,370	1,969,090
Implementation (US\$)			
CHW travel to households	-	-	11,501,590
Standardized blood pressure monitoring by CHWs	295,391,020	127,608,110	49,821,570
Home health education	462,193,000	140,348,140	141,200,400
Coordination at hypertension triage counter	6,358,030	7,018,380	1,815,110
Health care utilization costs (US\$)			
Medication	221,291,980	165,204,210	151,351,720
Total incremental cost (US\$)	1,421,174,180	766,327,830	377,973,350
Estimated number of rural hypertensives aged 40 or above	9,671,504	5,619,670	3,428,737
Lifetime incremental cost per participant (US\$)	146.90	136.40	110.20

Supplement C: Sensitivity analysis – changes in antihypertensive medication use, other utility measures, and systolic blood pressure

Supplemental Table C1: Results of one-way sensitivity analyses (all monetary values in 2020 US\$, rounded to nearest \$0.10)

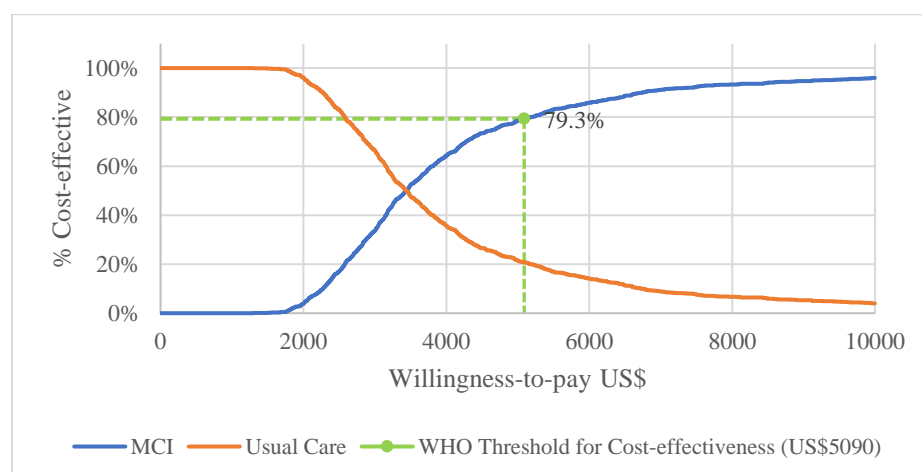
Parameter	Base case value	Critical value	Percentage difference from base case value
Incremental cost per participant (US\$)*			
Bangladesh	146.90	217.80	48.24%
Pakistan	136.40	268.00	96.50%
Sri Lanka	110.20	332.40	201.54%
Mean systolic blood pressure reduction (mmHg)†			
Bangladesh	4.39	2.96	-32.54%
Pakistan	4.99	2.54	-49.11%
Sri Lanka	6.22	2.06	-66.84%
Percentage reduction in disability-adjusted life-years (DALYs) per unit systolic blood pressure reduction†			
Bangladesh	2.20%	1.48%	-32.54%
Pakistan	2.20%	1.12%	-49.11%
Sri Lanka	2.20%	0.73%	-66.84%

*Critical value shows parameter value above which intervention is no longer cost-effective based on WHO thresholds. †Critical value shows parameter value below which intervention is no longer cost-effective based on WHO thresholds

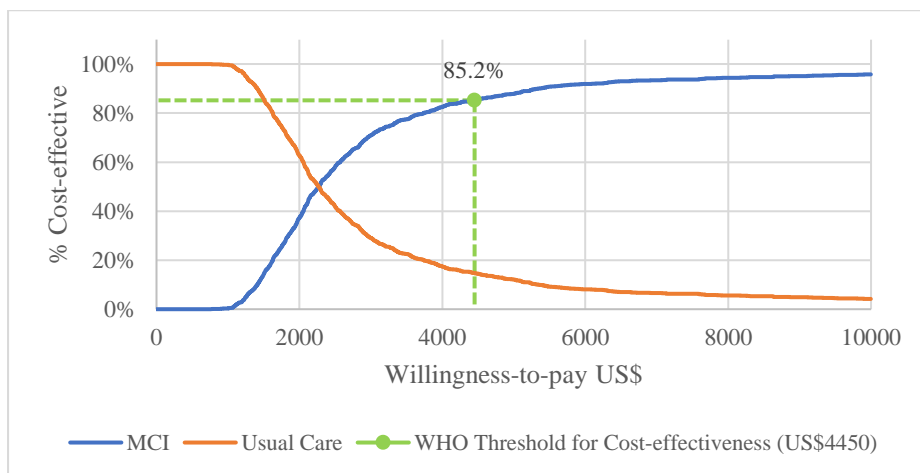
Supplemental Table C2: Results of one-way sensitivity analyses of incremental cost per participant with base case discount rate at 3% and case with discount rate at 6% (all monetary values in 2020 US\$, rounded to nearest \$10)

Parameter	At discount rate of 3% (base case)	At discount rate of 6%	Percentage difference from base case value
Bangladesh			
Total incremental cost from cost-effectiveness analysis (US\$)	1,421,174,180	1,092,472,140	-23.13%
Incremental cost per cardiovascular disease DALY averted (US\$)	3,430	2,640	
Pakistan			
Total incremental cost from cost-effectiveness analysis (US\$)	766,327,830	600,856,310	-21.59%
Incremental cost per cardiovascular disease DALY averted (US\$)	2,270	1,780	
Sri Lanka			
Total incremental cost from cost-effectiveness analysis (US\$)	377,973,350	297,250,220	-21.36%
Incremental cost per cardiovascular disease DALY averted (US\$)	4,080	3,210	

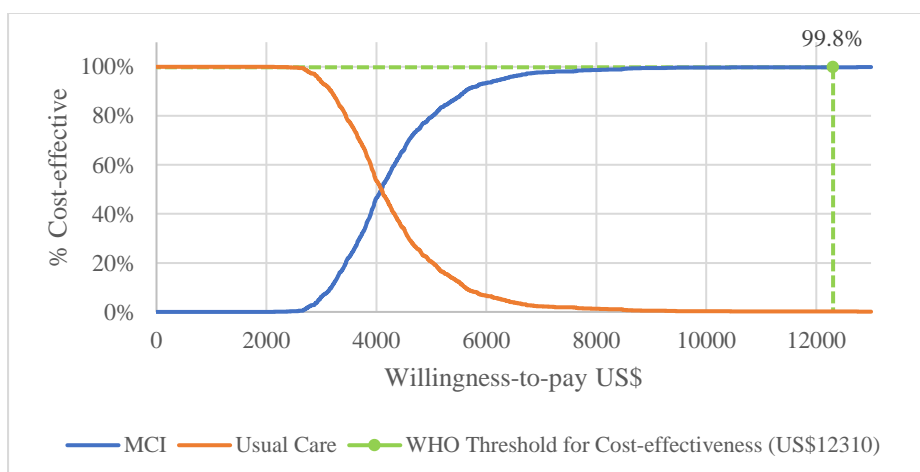
Supplemental Figure C1a: Cost-effectiveness acceptability curves for Bangladesh



Supplemental Figure C1b: Cost-effectiveness acceptability curves for Pakistan



Supplemental Figure C1c: Cost-effectiveness acceptability curves for Sri Lanka



Supplemental Table C3. Outcome of number of antihypertensive medications used due to COBRA-BPS in Bangladesh, Pakistan, and Sri Lanka

	Baseline				Change at 24 months from baseline				Difference in change between Intervention and Control
	Intervention (COBRA-BPS)		Control		Intervention (COBRA-BPS)		Control		
Country	N	Mean (SD)	N	Mean (SD)	N	Mean (95% CI)*	N	Mean (95% CI)*	Difference (95% CI)
Bangladesh	447	1.16 (0.79)	448	1.19 (0.87)	406	0.27 (0.14, 0.40)	389	0.18 (0.06, 0.31)	0.09 (-0.09, 0.27)
Pakistan	450	0.57 (0.70)	444	0.54 (0.71)	420	-0.03 (-0.12, 0.05)	411	-0.12 (-0.21, -0.04)	0.09 (-0.03, 0.21)
Sri Lanka	433	1.26 (0.92)	423	1.34 (0.99)	398	0.22 (0.15, 0.30)	374	0.07 (-0.00, 0.15)	0.15 (0.04, 0.26)
Overall	1330	0.99 (0.87)	1315	1.02 (0.93)	1224	0.15 (0.10, 0.20)	1174	0.04 (-0.01, 0.09)	0.11 (0.04, 0.18)

*Mean was calculated as the change from baseline at Month 24, adjusted for baseline number of antihypertensive uses, distance from centre of village cluster to government clinic, age, gender, treatment group, follow up visit period, and interaction factor of the last two.

Supplemental Table C4. Outcome of healthcare provider visits (annualised) due to COBRA-BPS in Bangladesh, Pakistan, and Sri Lanka

	Baseline				Change at 24 months from baseline				Difference in change between Intervention and Control
	Intervention (COBRA-BPS)		Control		Intervention (COBRA-BPS)		Control		
Country	N	Mean (SD)	N	Mean (SD)	N	Mean (95% CI)*	N	Mean (95% CI)*	Difference (95% CI)
Bangladesh	447	3.06 (7.39)	448	2.71 (6.67)	406	-0.42 (-1.21, 0.38)	389	0.38 (-0.42, 1.19)	-0.80 (-1.92, 0.32)
Pakistan	450	2.93 (7.10)	444	3.62 (7.97)	420	-2.70 (-3.09, -2.32)	411	-2.83 (-3.21, -2.44)	0.12 (-0.42, 0.66)
Sri Lanka	433	9.51 (8.93)	423	9.82 (8.92)	398	1.45 (0.08, 2.82)	374	0.23 (-1.16, 1.62)	1.23 (-0.70, 3.16)
Overall	1330	5.12 (8.40)	1315	5.30 (8.48)	1224	-0.47 (-1.03, 0.08)	1174	-0.67 (-1.23, -0.11)	0.20 (-0.58, 0.98)

*Mean was calculated as the change from baseline at Month 24, adjusted for baseline number of healthcare provider visits (annualised), distance from centre of village cluster to government clinic, age, gender, treatment group, follow up visit period, and interaction factor of the last two.

Supplemental Table C5. Outcome of lab test taken (annualised) due to COBRA-BPS in Bangladesh, Pakistan, and Sri Lanka

	Baseline				Change at 24 months from baseline				Difference in change between Intervention and Control
	Intervention (COBRA-BPS)		Control		Intervention (COBRA-BPS)		Control		
Country	N	Mean (SD)	N	Mean (SD)	N	Mean (95% CI)*	N	Mean (95% CI)*	Difference (95% CI)
Bangladesh	447	1.40 (6.53)	448	1.29 (6.29)	406	0.07 (-0.57, 0.72)	389	0.08 (-0.58, 0.73)	-0.00 (-0.91, 0.90)
Pakistan	450	0.24 (2.71)	444	0.08 (0.98)	420	0.15 (-0.11, 0.41)	411	0.06 (-0.20, 0.32)	0.09 (-0.27, 0.46)
Sri Lanka	433	4.38 (10.04)	423	3.43 (7.26)	398	1.02 (-0.13, 2.17)	374	0.72 (-0.46, 1.89)	0.31 (-1.32, 1.93)
Overall	1330	1.98 (7.25)	1315	1.57 (5.70)	1224	0.44 (0.00, 0.89)	1174	0.31 (-0.14, 0.76)	0.13 (-0.49, 0.76)

**Mean was calculated as the change from baseline at Month 24, adjusted for baseline number of lab test taken (annualised), distance from centre of village cluster to government clinic, age, gender, treatment group, follow up visit period, and interaction factor of the last two.*

Supplemental Table C6. Outcome of hospital visits (annualised) due to COBRA-BPS in Bangladesh, Pakistan, and Sri Lanka

	Baseline				Change at 24 months from baseline				Difference in change between Intervention and Control
	Intervention (COBRA-BPS)		Control		Intervention (COBRA-BPS)		Control		
Country	N	Mean (SD)	N	Mean (SD)	N	Mean (95% CI)*	N	Mean (95% CI)*	Difference (95% CI)
Bangladesh	447	0.03 (0.28)	448	0.06 (0.42)	406	-0.03 (-0.04, -0.02)	389	-0.03 (-0.04, -0.02)	-0.00 (-0.02, 0.01)
Pakistan	450	0.01 (0.20)	444	0.02 (0.25)	420	-0.00 (-0.01, 0.01)	411	-0.01 (-0.02, 0.00)	0.00 (-0.01, 0.02)
Sri Lanka	433	0.30 (1.00)	423	0.31 (1.05)	398	-0.11 (-0.19, -0.02)	374	-0.00 (-0.09, 0.09)	-0.10 (-0.23, 0.02)
Overall	1330	0.11 (0.62)	1315	0.13 (0.67)	1224	-0.04 (-0.07, -0.02)	1174	-0.01 (-0.04, 0.02)	-0.03 (-0.07, 0.01)

**Mean was calculated as the change from baseline at Month 24, adjusted for baseline number of hospital visits (annualised), distance from centre of village cluster to government clinic, age, gender, treatment group, follow up visit period, and interaction factor of the last two.*

Supplemental Table C7. Mean systolic blood pressure reductions with respective standard errors in Bangladesh, Pakistan, and Sri Lanka

	Mean	SE
Change in systolic blood pressure from baseline at Month 24		
Bangladesh	-4.39	1.76
Pakistan	-4.99	2.37
Sri Lanka	-6.22	1.39

Supplement D: Others

Supplemental Table D1. Units needed for scale-up

Units	Bangladesh	Pakistan	Sri Lanka
CHW Training Cycles*	2519	5636	367
CHW Trainees	122,000 ^{S6}	110,000 ^{S7}	6,247 ^{S8}
District-level program coordinators	64	158	25
Primary health care center-level CHW supervisors	421 ^{S9}	5478 ^{S10}	963 ^{S8}

**Bangladesh: Training of trainers per district (64 districts), 5 CHW trainings per sub district (491 sub districts).^{S11} Pakistan: Training of trainers per district (158 districts), 1 CHW training per sub district (5478 sub districts approximated from the number of Basic Health Units).^{S10} Sri Lanka: Training of trainers per district (25 districts), 1 CHW training per sub district (342 sub districts).^{S8}*

Supplemental Table D2: Population statistics in Bangladesh, Pakistan, and Sri Lanka (population in millions)

Country	National population ^{S12}	National population aged 40+ years ^{S12}	National rural population ^{S12}	Eligible rural population aged 40+ years ^{S12*}	Within trial hypertension prevalence	Expected rural population aged 40+ years to screen positive for hypertension
Bangladesh	164.67	45.42	105.62	29.13	33.2% (1,474 of 4,442)	9.67
Pakistan	197.02	45.77	125.22	17.45	32.2% (1,532 of 4,760)	5.62
Sri Lanka	21.44	8.56	17.50	6.98	49.1% (1,134 of 2,308)	3.43

**In Bangladesh and Sri Lanka, 100% of rural population are covered by CHWs, while only 60% of rural population in Pakistan are covered by them.*

Supplemental Table D3: Year one rural household statistics (number of households in millions)

Country	Mean rural household size ^{S13-S15}	Number of rural households to visit for screening*	Percentage of rural households having at least one hypertensive patient aged 40+	Number of rural households having at least one hypertensive patient aged 40+
Bangladesh	4.5	23.47	32.86%	7.71
Pakistan	6.8	11.05	34.78%	3.84
Sri Lanka	3.8	4.61	46.39%	2.14

**Values are calculated by taking national rural population divided by mean rural household size. In Bangladesh and Sri Lanka, 100% of rural population are covered by CHWs, while only 60% of rural population in Pakistan are covered by them.*

Supplemental Table D4: CHW rate per 100,000 population and CHWs/km² in Bangladesh, Pakistan, and Sri Lanka

Country	Number of CHWs for scale up ^{S6-S8}	National Population ^{S12}	CHW rate per 100,000	Land area ^{S12} (km ²)	CHWs/km ²
Bangladesh	122,000	164,669,751	74.08	130,170	0.94
Pakistan	110,000	197,015,955	55.83	770,880	0.14
Sri Lanka	6,247	21,444,000	29.13	62,710	0.09

Supplemental Table D5: Gross domestic product, annual health expenditure, and additional annual health expenditure due to COBRA-BPS per capita (all monetary values in 2020 US\$, absolute costs rounded to nearest \$10, costs in two decimal places rounded to nearest \$0.01)

Country	Gross domestic product per capita (US\$) ^{S12}	Annual health expenditure per capita (US\$) ^{S12}	Additional annual health expenditure per capita due to COBRA-BPS (US\$)	Percentage increase
Bangladesh	1,560	36.28	0.63	1.74%
Pakistan	1,460	44.59	0.29	0.65%
Sri Lanka	4,080	159.49	1.03	0.65%

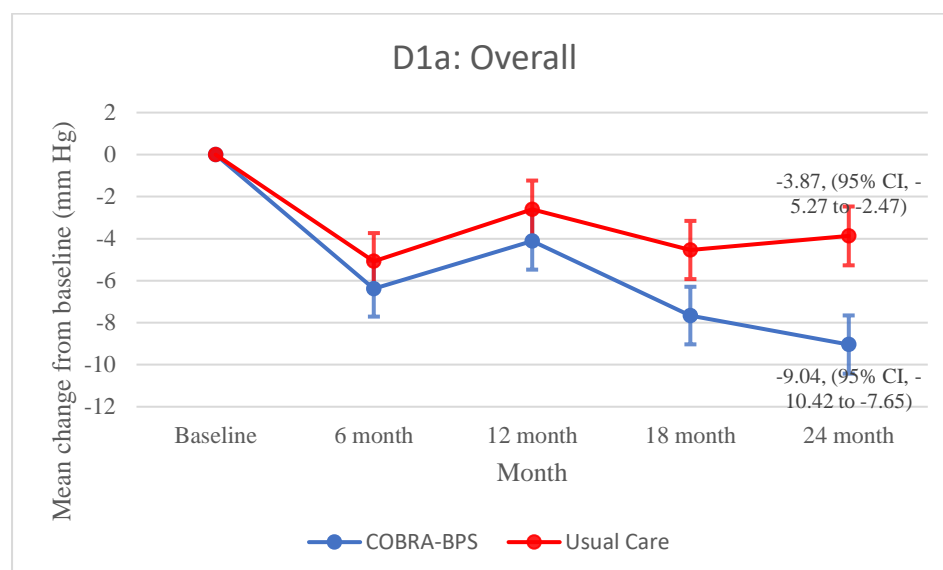
Supplemental Table D6. Average yearly costs and incremental yearly costs for antihypertensive medications borne by each subject in Bangladesh, Pakistan and Sri Lanka (all monetary values in 2020 US\$)

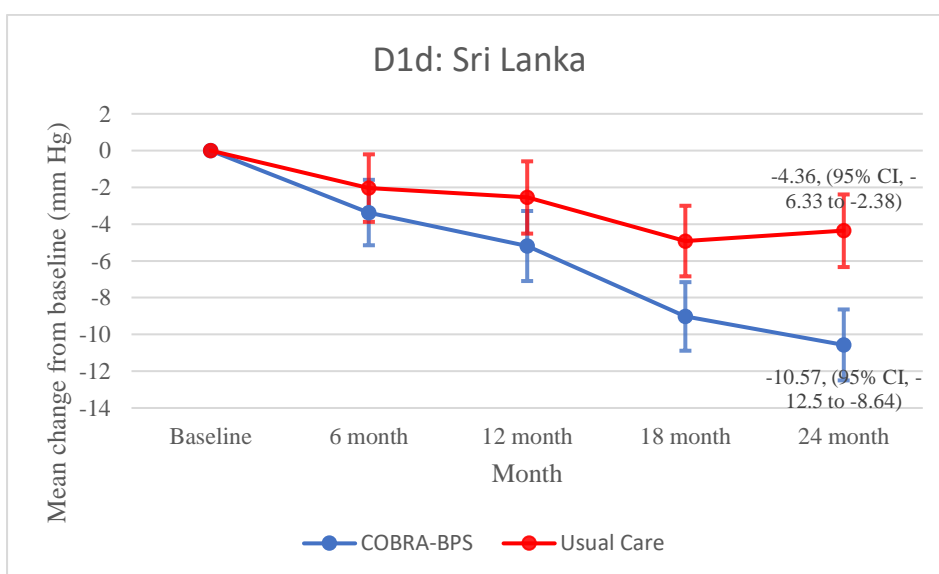
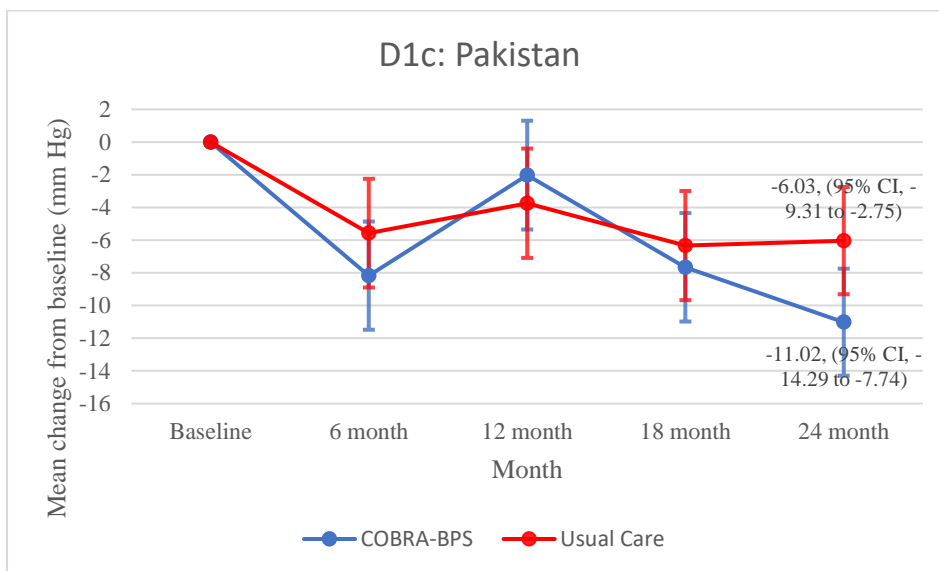
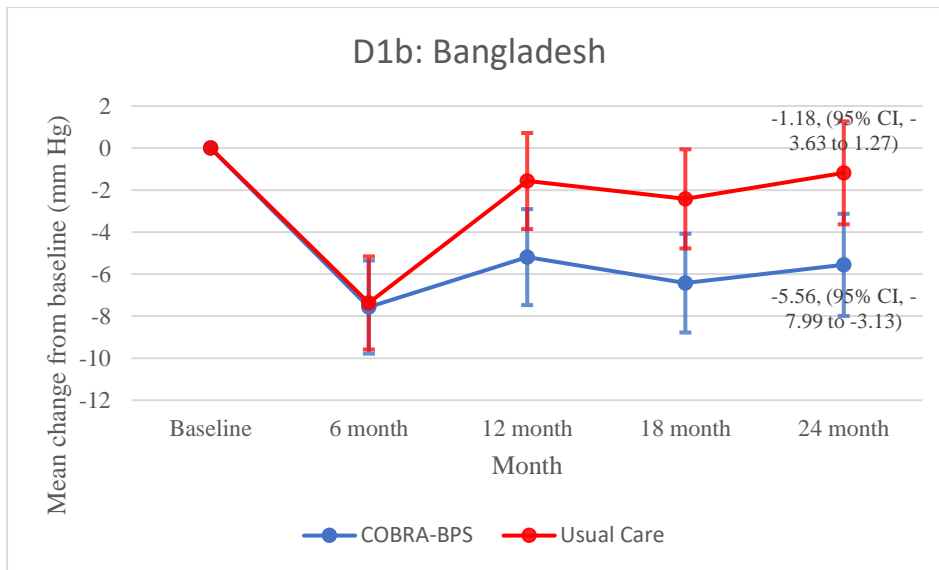
Country	Average yearly cost for antihypertensive medications at baseline (US\$)*		Average yearly cost for antihypertensive medications at 24 months (US\$)*		Incremental yearly cost of antihypertensive medications at 24 months (US\$) [†]
	Intervention (COBRA-BPS)	Control	Intervention (COBRA-BPS)	Control	
Bangladesh	12.76	14.47	20.84	20.83	1.31
Pakistan	10.30	10.31	10.75	7.27	1.79
Sri Lanka	23.29	24.52	27.43	27.62	2.78

*Values are derived by taking average yearly cost for an anti-hypertensive medication at baseline or 24 months, multiplied by number of antihypertensive medications used at baseline or 24 months in each country and adherence rate of 75%

[†]Values are derived by taking average yearly cost for an anti-hypertensive medication at 24 months, multiplied by incremental number of antihypertensive medications used at 24 months in each country and adherence rate of 75%

Supplemental Figure D1a-d: Mean change in systolic blood pressure over time, overall and by country^{S16*}





**Mean changes from baseline were estimated from a generalized linear mixed-model for repeated measures for the change in systolic blood pressure, with fixed effects for baseline value of mean systolic blood pressure, country (for 'Overall' only), distance of the cluster from the clinic, age, sex, time, and interaction of time with trial group, and with random effects of clusters.^{S16}*

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