Policy Brief #6

Issuing guidelines for cardiovascular disease (CVD) risk screening and management to public health clinics does not ensure that CVD patients visiting these clinics will have improved CVD behavior and outcomes later.

UPecon Foundation

Effectiveness of Clinic-Based Cardiovascular Prevention in the Philippines[1]

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Introduction

Cardiovascular diseases (CVDs) are the number 1 cause of mortality in the Philippines, accounting for around one-third of all deaths in the country in 2017, just above the global average. To address this problem, the Philippine Department of Health (DOH) adopted WHO's Essential Package of Noncommunicable Disease (NCD) Intervention for Primary Health Care in Low Resource Settings (PEN) in 2012 by introducing the protocol PhilPEN for the integrated management of diabetes and hypertension in primary public health clinics (rural and urban health centers). The PhilPEN protocol is applied to all patients aged 25 years or older and irrespective of their reason for visiting public clinic. The protocol is used on patients with no previously established CVD through risk assessment, risk screening (if at CVD risk, e.g., aged 40+), referral (e.g., if hypertensive and aged <40 or with symptoms of heart disease), prediction of global CVD risk score, and depending on the score and individual risk factors, medication (of hypertension, diabetes, and dyslipidemia), and/or lifestyle counselling.

DOH provided technical assistance and staff training to primary health clinics in their implementation of the protocol, and urged local government units (LGUs) to adopt it in their clinics and to finance any associated costs above those covered by DOH and PhilHealth. DOH also supplied these clinics with three antihypertensive drugs (amlodipine, losartan, and metropolol) and one diabetes medication (metformin). However, DOH did not supply statins despite the protocol stipulating that they should be given to all patients with CVD risk score in excess of 30 percent and to those with particularly high cholesterol. DOH also called upon PhilHealth to include CVD and diabetes drugs under its primary care benefit program, then being pilot-tested in some sites.

The objective of this study is to estimate the extent to which a participant visit to a PhilPEN-implementing clinic is effective in raising exposure to CVD prevention.

[1]Based on the article "Effectiveness of clinic-based cardiovascular disease prevention: A randomized encouragement design experiment in the Philippines" by Joseph Capuno, Aleli Kraft, and Owen O'Donnell. *Social Science and Medicine* **283** (2021). https://doi.org/10.106/socscimed.2021.114194

Data and Method

Sampling design – The study relied on the results of a cluster-randomized trial in barangays in Nueva Ecija, a mainly agricultural province in Central Luzon, which was chosen because of the province's higher-than-national-average prevalence of CVD risk factors, i.e., elevated blood pressure, smoking, overweight/obesity, unhealthy diet, physical inactivity, and high total cholesterol. The province's 849 barangays were first stratified into urban and rural classification. The study then randomly drew and assigned an equal number to an intervention group (137 barangays or clusters) and control group (137 clusters), for a total of 274 clusters.

To induce random variation in visits to public health clinics carrying out the PhilPEN protocol, the study offered a lottery ticket with a money prize of PhP 5,000 (approximately US$100) to those in the intervention group conditional on their going for a checkup at a public health clinic. Randomization at the barangay level meant there was no scope within the barangay for the lottery incentive to spill over to influence control participants' propensity to visit a clinic. Within each sample barangay, around 12 households per were randomly selected using interval sampling for interview at baseline.

At the household level, one person was interviewed who (a) was aged 40-70 years old, (b) had not been diagnosed with heart disease or diabetes, (c) had not suffered a stroke or heart attack, (d) was not currently taking medication for hypertension, and (e) was not having any health condition that would prevent measurement of height, weight, or blood pressure. During the baseline survey, the randomly selected study participant in the household was asked about their sociodemographic profile, health status, family CVD history, health care utilization, health insurance coverage, urban/rural residence, educational attainment, and employment status.

A total of 1865 and 1861 households in the intervention and control groups, respectively, were approached for interview at baseline. Due to non-response, refusal or ineligibility, however, there were only 1697 participants in the former group and 1724 participants in the latter group at baseline.

Timing – The baseline interviews were done from January to May 2018 while the endline interviews were done from September to November 2018. The average time between baseline and endline interviews was 7.5 months. All outcomes were measured at the endline survey to create an indicator of whether each participant had visited a clinic since baseline.

Outcomes to be measured – The study pre-specified a number of outcomes along a hypothesized causal chain from a check-up visit (i.e., CVD prevention processes) to predicted CVD risk. These are :

- Measurement – (a) blood pressure; (b) blood sugar or cholesterol
- Diagnosis – (c) hypertension; (d) undiagnosed hypertension; (e) diabetes, dyslipidemia, or heart disease
- Medication – (f) hypertension; (g) diabetes or dyslipidemia
- Medical advice – (h) quit smoking; (i) less alcohol; (j) less salt and fat; (k) more fruit, vegetables, and pulses; (l) lose weight; (m) more exercise
- Health behavior – (n) smoker; (o) heavy episodic drinker; (p) fruit and vegetables; (q) no salt; (r) physically active
- CVD risk factors – (s) systolic blood pressure; (t) hypertension; (u) body mass index; (v) overweight; (w) waist circumference; (x) central obesity
- Global CVD risk – (y) CVD risk score;(z) elevated CVD risk; (zz) high CVD risk

[2] Specifically, a treatment participant is offered a non-transferable coupon that can be exchanged for a lottery ticket at the public clinic. The participant is also instructed to ask for a medical assessment while at the clinic, although this is not a condition for entering a lottery. One winner per treatment cluster was drawn. The winners were paid by electronic money transfer or courier.
[3] Such contamination was unlikely, although not impossible, between barangays.
[4] The definitions and measurement of these outcomes are in the journal article.

Key Findings

Comparison of control versus intervention groups on baseline outcomes – The null hypothesis tested is that there is no difference between the control and intervention groups across 27 outcome measures (marked a to zz in the list above). The high p-values in almost all the outcome measures save blood sugar or cholesterol and two health behavior outcomes (never adding salt to food, and daily physical activity) -- indicate statistical non-significance in the difference in the mean outcomes between the two groups at baseline. This indicates the analysis sample from intervention group (n=1573) and control group (n=1578) is very well balanced prior to the intervention.

Comparison of control versus intervention groups on baseline covariates – The high p-values of almost all baseline covariates indicate that there is no statistically significant difference between the control and intervention groups. The two groups differed significantly (5 percent level) in the baseline mean values of only two covariates (high school graduate, and number of visits to public health clinic in the last six months).

Effects on aggregated outcomes – Table 1 shows the effects of a check-up clinic visit on aggregated outcomes. The conditional offer of a lottery ticket had a large effect on clinic attendance. It raised the probability of visiting a clinic between baseline and endline by 47.32 percentage points. On average, the lottery induced around 7 participants per barangay to visit a clinic within a six-week period. Visiting a clinic raised participants' exposure to clinic-centered CVD prevention process indicators (shown by low p-value which shows statistical significance in Column 1) but did not appear to have any impact on health behavior (Column 2) or global CVD risk factors (Column 3) (shown by high p-values which reflect statistical non-significance).

Table 1. Effects of a Check-up Clinic Visit on Aggregated Outcomes

	CLINIC-CENTERED (1)	HEALTH BEHAVIOR (2)	GLOBAL CVD RISK (3)
Local Average Treatment Effect (LATE)*	0.1562	0.0337	0.0055
Std error	(0.0508)	(0.0648)	(0.2567)
Naive p- value	0.0021	0.6038	0.9829
First stage**	0.4732	0.4741	0.4745
Std error	(0.0216)	(0.0216)	(0.0215)
F statistic	489.4	490.1	493.2
n clusters (barangays)	274	274	274
n participants	3,151	3,151	3,151

Notes: Column (1) and Column (2) are weighted averages of effect sizes of Outcomes a-c + e-m (Col. 1) and o-r (Col. 2). Column (3) is for predicted 10-year CVD risk using WHO's Globorisk model. * First row gives two-stage least squares estimates of effects of a clinic visit.** First stage is ordinary least squares estimate of the effect of lottery offer on the probability of a clinic visit.

Effects on specific outcomes – Table 2 shows the effects of a check-up clinic visit on specific outcomes. Visiting a clinic for a check-up was estimated to significantly raise 7 of the 12 outcomes (shown in bold). As to health behavior outcomes, there was significant positive effect only on abstinence from adding salt to cooked food. There was no effect on physiological CVD risk factors.

Conclusions

In general, a visit to a PhilPEN-implementing clinic had mostly null effects on health behavior, risk factors, and predicted CVD risk. This muted result is sobering but is consistent with other studies on CVD high-risk populations in low- and middle-income countries. The finding implies that issuing clinics with PEN guidelines for CVD risk screening and management was not sufficient to ensure that predominantly poor individuals got more diagnosis and medication for CVDs.

Table 2 . Effects of a Check-up Clinic Visit on Specific Outcomes

OUTCOMES	EFFECT	STANDARD ERROR	NAÏVE P-VALUE
Measurement			
a. Blood pressure	**0.1699**	**(0.0597)**	**0.0048**
b. Blood sugar or cholesterol	-0.0028	(0.0243)	0.9091
Diagnosis			
c. Hypertension	**0.0354**	**(0.0220)**	**0.0846**
d. Undiagnosed hypertension	-0.0108	(0.0295)	0.7146
e. Diabetes, dyslipidemia, or heart disease	-0.0122	(0.0126)	0.3341
Medication			
f. Hypertension	0.0221	(0.0171)	0.1727
g. Diabetes or dyslipidemia	-0.0065	(0.0093)	0.4737
Medical advice			
h. Quit smoking	**0.0357**	**(0.0177)**	**0.0182**
i. Less alcohol	0.0173	(0.0115)	0.1121
j. Less salt and fat	**0.0684**	**(0.0315)**	**0.0243**
k. More fruit, veg., and pulses	**0.1280**	**(0.0408)**	**0.0008**
l. Lose weight	**0.0464**	**(0.0203)**	**0.0119**
m. More exercise	**0.0287**	**(0.0163)**	**0.0610**
Health behavior			
n. Smoker	0.0019	(0.0179)	0.9172
o. Heavy episodic drinker	0.0066	(0.0249)	0.7895
p. Fruit and veg. eater	-0.0322	(0.1587)	0.8394
q. No salt	**0.0850**	**(0.0508)**	**0.0866**
r. Physically active	0.0599	(0.0757)	0.4311
CVD risk factors			
s. Systolic blood pressure	-0.4381	(0.9676)	0.6507
t. Hypertension	0.0036	(0.0292)	0.9028
u. Body mass index	-0.0393	(0.1030)	0.7029
v. Overweight	0.0089	(0.0186)	0.6314
w. Waist circumference	-0.0839	(0.4799)	0.8599
x. Central obesity	0.0106	(0.0203)	0.6056
Global CVD risk			
y. Elevated CVD risk	-0.0225	(0.0245)	0.3559
z. High CVD risk	0.0349	(0.0187)	0.0449

Note: Outcomes in **bold** are statistically significant; those not in bold are not statistically significant.