Hypertension

RESEARCH LETTER

Utilizing Mobile Health Units for Mass Hypertension Screening in Socially Vulnerable Communities Across Detroit

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Nearly half of all adults in the United States have hypertension, defined as a blood pressure (BP) ≥130/80 mm Hg. However, both the prevalence (56%) and control rates (18%) are worse in Black patients.[1] Numerous social determinants of health in socially vulnerable populations further exacerbate these disparities while reducing hypertension awareness and access to health care.[2] Few places exemplify this crisis like the city of Detroit (78% Black race) where hypertension rates are the highest in Michigan (https://www.cdc.gov/places) and all census tracks are in health professional shortage areas (https://data.hrsa.gov/tools/shortage-area/). As such, the public health importance of large-scale screening efforts to identify the enormous number of individuals with hypertension cannot be overstated.[3] We here describe the first-year results using our novel Wayne Health Mobile Unit program developed in collaboration with Wayne State University to address health disparities in Detroit.[4]

METHODS

The Wayne Health Mobile Unit program, launched March 2020, comprises a fleet of up-fitted Ford Transit vans staffed with multiple personnel[4]. The initial focus on coronavirus disease 2019 (COVID-19) testing was rapidly expanded to additional health care capabilities given community needs. Five to 7 mobile health units deploy 5 to 6 days per week to 376 available community partner locations covering the Detroit area targeting locations with higher social vulnerability using specialized geocoding methodologies.[4]

Given the large population serviced (while also ensuring resiliency of the program during cold weather and COVID restrictions), we developed a high-throughput method to offer screening for high BP (defined as ≥120/80 mm Hg) beginning in November 2020. Those driving to a site (≈90%) rested inside their parked car for ≥5 minutes. BP was then measured using an Omron 907XL monitor following a guideline-consistent protocol—up to an average of triplicate upper arm readings (1-minute intervals) using a correct cuff size with the arm supported at heart level (door armrest) and feet resting on the car floor. A minority (<10%) of walk-up patients had seated BP measured in mobile health units canopy rooms. As privacy was limited, BP measurements were attended and cuffs were placed over long-sleeves when relevant.

All patients are provided follow-up care in the Wayne Health system per individual needs/wishes. Health information, including prior hypertension status, is collected but not currently available for the entire cohort. Individuals with a screening systolic BP ≥130 mm Hg requiring primary care or social services were invited to enroll into an associated, Center for Disease Control-supported quality improvement program (Bring-it-Down) capturing health information.

RESULTS

As of December 2021, 53 305 unique patient visits had been conducted at ≈1400 events. During the first year of offering BP screening (November 2020 to December 31, 2021), 3040 individuals elected to participate. Roughly 63% of patients had high BP values with nearly one-third in the stage-II hypertension range (Table). Among Bring-It-Down participants (n=143), 42% had no prior

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Nonstandard Abbreviations and Acronyms

BP	blood pressure
COVID-19	coronavirus disease 2019

diagnosis of hypertension or were unaware of their BP status; whereas 59% had confirmation of clinic follow-up.

DISCUSSION

Hypertension persists as a leading risk factor for mortality. Unfortunately, control rates (≈20%) are worsening while nearly one-quarter (≈25 million) of adults are not aware of their hypertension.[1] The true percentage of unaware hypertensives, especially among those not receiving medical care (ie, hiding out-of-site); however, is likely much higher[3]. This is particularly relevant for socially vulnerable communities as our results suggest (≈42%). Innovative approaches that better enable the identification of individuals with hypertension across the United States while fostering improved access to medical follow-up are of critical public health importance. The first-year findings from our Wayne Health Mobile Unit program demonstrate the feasibility and success of our novel strategy. The relatively low number of BP screenings compared to total visits was due to it being optional, whereas many individuals were only seeking care for COVID testing/vaccination. Moving forward, BP screening will be performed in everyone, unless specifically declined, thereby markedly increasing (perhaps by an order of magnitude) the number of people with potential hypertension identified and linked to care.

Mobile health units have existed for some time (https://www.mobilehealthmap.org/). The Family Van serving 6 Boston neighborhoods has shown success in lowering BP.[5] However, our program is unique for several reasons including its large scale (7 vehicles and growing), skilled staffing (nurses, community health workers), near-daily deployment encompassing hundreds of partnering locations, and vast reach to a large population living across a wide geographic area. Other special capabilities include assessments for multiple acute and chronic conditions, data collection within Wayne Health's clinical electronic medical record allowing for seamless linkages to medical or social service care, and onsite blood draws. Finally, we have recently launched 3 trials to elucidate best practice implementation approaches and follow-up management strategies for individuals with elevated or high BP. Future analyses will validate the accuracy of BP measurement in a car, assess the percentage of patients with hypertensive screening BPs who are confirmed to have hypertension on follow-up (and differentiate those with a new diagnosis from previously-known but uncontrolled hypertension), and document our ultimate success in controlling BP.

Table. BP Screening Results

Categories	N, %	BP,* mm Hg
All patients	3039	126.9±23.1/76.8±14.7
Normal BP	1136 (37%)	105.5±9.28/65.0±8.34
Systolic BP <120 and diastolic BP <80 mm Hg		
High BP categories†		
Elevated BP	306 (10%)	124.2±2.8/70.1±6.44
Systolic BP 120–129 and diastolic BP <80 mm Hg		
Hypertension categories‡	1597 (53%)	142.7±19.39/86.4±12.43
Systolic BP ≥130 or diastolic BP ≥80 mm Hg		
Stage I	629 (21%)	127.7±8.73/80.3±6.84
Systolic BP 130–139 or diastolic BP 80–89 mm Hg		
Stage II	968 (32%)	152.4±18.15/90.4±13.6
Systolic BP ≥140 or diastolic BP ≥90 mm Hg		
Bring it Down study subset		
Enrolled hypertensive patients	143	
No known prior hypertension or diagnosis	48 (34%)	
Prior diagnosis of hypertension	84 (59%)	
Unknown BP status	11 (8%)	
Age, y	55±12*	
Sex (female)	68 (48%)	
Race and ethnicity		
Black	137 (96%)	
White	2 (1%)	
Other	4 (3%)	
Clinic follow-up confirmed	84 (59%)	

BP indicates blood pressure.
*Mean±SD.
†High BP categories encompass all levels of BP above normal.
‡Hypertension categories represent patients with screening BP readings within hypertension ranges. The formal diagnosis of hypertension requires ≥2 BP readings performed during ≥2 separate occasions.[1] Patients were not given the diagnosis of hypertension by this single screening event, rather their BP readings were categorized within the hypertension range. Subsequent follow-up BP readings were required and recommended.

ARTICLE INFORMATION

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Disclosures

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