

## Evaluating public health vending machine rollout and utilization in criminal-legal settings

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### ABSTRACT

**Introduction:** Harm reduction resources for people who are involved in the criminal-legal system should be easily accessible. The Rhode Island Department of Corrections (DOC) used funding from a state opioid stewardship fund created through the Rhode Island Opioid Stewardship Act (legislation passed in 2019) to implement five custom-designed vending machines for community corrections offices and state awaiting trial carceral facilities. The vending machines provide resources for overdose prevention, infection prevention, basic needs, and nicotine replacement therapy (NRT). We aim to describe the development and rollout of the vending machines and present data about items taken most frequently by setting.

**Methods:** Research and design experts, with DOC and community stakeholders, developed and tailored the public-facing design of the vending machines. Before implementation, the researchers from the development team conducted meetings with staff at each location to discuss harm reduction and their role in addressing the opioid crisis in this high-risk population. The machines were manufactured in 2022 and installed in early 2023 (dates varied by location). The community support and advocacy organization tracks and maintains inventory (items taken and replaced) by month. No individual-level client data is collected.

**Results:** There were 3720 items dispensed from May 2022 to February 2024 across five locations. Overall, hygiene kits were the most frequently accessed item (28.3 %,  $n = 1051$ ), followed by NRT (19.0 %,  $n = 706$ ) and ponchos (16.6 %,  $n = 616$ ). The fentanyl tests ( $n = 230$ ), wound care kits ( $n = 248$ ), resource guide ( $n = 253$ ), naloxone ( $n = 221$ ), and safer sex kits ( $n = 218$ ) each made up between 5.9 % and 6.8 % of items accessed. The pregnancy test was the least accessed at 4.8 % ( $n = 177$ ). There were statistically significant differences in the monthly number of items distributed by location for the basic needs items, excluding NRT, with 39 items per month at the three Probation/Parole locations compared to 21 per month for the two DOC facilities.

**Conclusions:** The utilization patterns demonstrate the demand for basic supplies and support related to harm reduction. Monitoring and summarizing utilization ensures that the vending machines remain useful to the community and facilitates transparency and communication with stakeholders.

### 1. Introduction

Substance use disorder (SUD) has a significant public health impact and is associated with myriad social and health risks (e.g., overdose, hepatitis C and human immunodeficiency virus (HIV), unemployment, housing instability) (Volkow & Blanco, 2023). An estimated 48.7 million individuals in the United States (US) have an SUD (27.2 million drug use disorder; 29.5 million alcohol use disorder; 8.0 both) (Substance Abuse and Mental Health Services Administration, 2023). Many individuals with an SUD experience poor access to healthcare services contributing to low SUD treatment utilization (Blanco & Volkow, 2019). Substance use-related health and social risks and the treatment gap are especially stark for those involved with the criminal-legal system (Saloner et al., 2016; Sugarman et al., 2020). The experience of incarceration can

exacerbate poor health outcomes upon release (e.g., increased infectious disease risk, overdose risk) (Binswanger et al., 2013; Stone et al., 2021). Therefore, access to evidence-based treatment (e.g., medication for opioid use disorder) may especially benefit this population (Green et al., 2018; Martin et al., 2023; Stone et al., 2021); however, individuals may face barriers to treatment, may not desire treatment, or may need additional and different health-promoting strategies during the post-incarceration and community supervision periods.

#### 1.1. Rationale

Harm reduction is a person-centered public health approach to prevent overdose and disease transmission (Centers for Disease Control and Prevention, 2022; Hawk et al., 2017; Marlatt, 1996) that is recognized as

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a key strategy to address the opioid overdose public health crisis (U.S. Department of Health and Human Services, 2021). A few harm reduction resources that reduce overdose mortality and infectious disease transmission include the use of clean syringes and other drug use supplies, naloxone, and overdose prevention education (National Institute on Drug Abuse, 2022). Over past decades in the US, harm reduction resources have been commonly disseminated via syringe service programs (SSPs), often brick and mortar service locations where people who use drugs can access resources and support (e.g., naloxone, syringes, infectious disease testing, referrals to treatment) (Platt et al., 2017; Puzhko et al., 2022; Tookes et al., 2012). Many states in the US do not offer SSPs (Mackey et al., 2023) and, of those that do, some people who use drugs do not wish to access these services (Islam & Conigrave, 2007). Given the unabating rates of overdose and infectious disease transmission in the US, there is a need for additional and innovative methods to provide harm reduction supplies to people who use drugs (Davis & Carr, 2017; Nadelmann & LaSalle, 2017).

Harm reduction or public health vending machines (PHVM) are one mechanism to increase access to harm reduction supplies. PHVM are devices that mechanically deliver free health-promoting supplies. These machines often contain a broad range of supplies including naloxone (intranasal and injectable), safe drug use supplies (e.g., fentanyl test strips, syringes), and educational materials (e.g., treatment resource guides) (Otiashvili et al., 2022; Russell et al., 2023; Strike & Miskovic, 2018). Some even contain unique items like pregnancy tests, hygiene kits, gun locks, xylazine test kits, and HIV and HCV test kits which are specifically selected to enhance public health for a given community (Arendt, 2023; Chicago Department of Public Health, 2024; Foxx, 2024; Milwaukee County Department of Health and Human Services, 2024). PHVM are primarily placed in widely accessible settings, like community centers, social service centers, fire departments, libraries, and parks. The locations of the PHVM are typically selected based on a high rate of overdose or drug use and high population, to increase the potential benefit of the machines and the number of potential utilizers (Anne Arundel County Department of Health, 2024; Milwaukee County Department of Health and Human Services, 2024).

PHVM may especially attract and benefit subgroups of people who use drugs, primarily those who are less engaged with formal healthcare systems (McDonald, 2009; Obadia et al., 1999), such as younger people (Obadia et al., 1999; Wagner et al., 2022), women, and racial and ethnic minoritized groups (Islam & Conigrave, 2007). A promising study conducted in Clark County, Nevada, found that the implementation of community-based PHVM that provided naloxone was associated with decreased opioid overdose deaths (Allen et al., 2022). However, there remains a considerable lack of information about correctional-located PHVM (Russell et al., 2023). Given the unique needs of correctional environments (e.g., security considerations) and the potential value that PHVM could have for this population vulnerable to overdose (Green et al., 2018), it is necessary to understand the planning, implementation, and adaptations of, and outcomes associated with correctional-located PHVM.

### 1.2. Aims and objectives

Vending machines were selected by the Rhode Island Department of Corrections (DOC) as a strategy to increase access to naloxone, harm reduction supplies, and health items at key locations, leveraging funding from a state opioid stewardship fund created through the Rhode Island Opioid Stewardship Act (legislation passed in 2019). The availability of funding for the PHVMs was a selling point for DOC. The DOC leadership saw the funding as an opportunity to address the temporal needs of a high risk and high need population. The stewardship funds were used to purchase the machines, supplies for the machines, and the services of the community agencies to maintain supplies. In 2023, the DOC implemented five custom-designed PHVM located at community corrections offices and state awaiting trial carceral facilities. We aim to describe the

development, implementation, and use of these PHVM within criminal-legal settings in Rhode Island.

## 2. Material and methods

### 2.1. Design

This implementation evaluation study is observational, using the item distribution data generated by the vending machines.

### 2.2. Setting

Rhode Island (RI) is a small state that had the thirteenth highest overdose rate per capita for a given state in 2023 (Ahmad et al., 2024), with 404 annual overdose deaths (Rhode Island Governor's Overdose Task Force, 2024). Overdoses were more concentrated in communities with higher population density such as the cities of Providence, Woonsocket, and Pawtucket (Rhode Island Governor's Overdose Task Force, 2024).

Within RI, the unified correctional system is known for innovation in public health. RI was the first correctional system in the nation to provide all three types of medications to treat opioid use disorder for individuals with OUD during incarceration (Clarke et al., 2018). In the state of RI, five correctional locations were targeted as sites to implement PHVM, as these locations were frequented by individuals returning to the community or on probation or parole. These sites include two DOC facilities and three Probation & Parole (P&P) offices. The DOC facilities in Cranston, RI include: the Intake Service Center, which functions as the men's awaiting trial facility, with an average population of 810 (FY23) and approximately 718 commitments processed per month (approximately 36 days on average per individual), and the women's facility, which houses individuals who are awaiting trial or in minimum, medium or work release, with an average population of 122 (FY23) (State of Rhode Island Department of Corrections, 2023). The DOC facility PHVMs are located inside each building's lobby, accessible to individuals who are being released and visitors. The three P&P offices selected to implement PHVM were the busiest in RI, located in Providence, Pawtucket, and Woonsocket (Northern RI). As of June 2023, 17,607 individuals were on probation or parole in RI (State of Rhode Island Department of Corrections, 2023). The PHVM in the P&P offices are located in the lobby areas, accessible to anyone in the office buildings, including the general public, during business hours.

The population targeted by the PHVM intervention includes the individuals who visit those settings, which includes those served by the DOC, their family members or friends, and others in the public. The population the intervention is intended to benefit in particular includes individuals with SUD and family or friends of individuals with SUD. Posters and signage were posted throughout the DOC and P&P facilities, including the area adjacent to the PHVM, that advertised the machines and provided for instructions for use.

### 2.3. Description of vending machines

To develop these machines, the DOC used an existing framework for community-based PHVM located in Rhode Island through the AIDS Care Ocean State Prevention Center and Rhode Island Department of Health.

The machines' design was developed through a community-engaged approach. The setting for the PHVM necessitated consideration of stigma, ease of access, and anonymity. To this end research and design experts, with DOC and community stakeholders, developed and tailored the design to ensure it would be non-stigmatizing and welcoming to anyone who sees it. Design x Health is an innovation hub comprising students from Brown University, Rhode Island School of Design, and Alpert Medical School. The Design x Health team met with the investigative team and DOC health services leadership to set goals for the PHVM design, identify appropriate design PHVM elements for tailoring

to the context, and develop instructional posters for accessing products. The interdisciplinary team addressed issues specific to access of harm reduction products including stigma, ease of access, and anonymity.

Preparation strategies for implementation included securing buy-in from staff, leveraging subject matter experts to answer questions and address concerns, and tailoring contents for the audience. The investigators met with DOC security, P&P officers, supervisors, and staff at each office as a group. The significance of the overdose problem among RI's individuals involved in the criminal-legal system was presented along with an overview harm reduction philosophy and a description of the PHVM was presented. Discussion to provide the opportunity to ask questions, express concerns, and provide input about PHVM items and placement of the PHVM.

The PHVM were manufactured by a third-party vendor according to specifications provided based on the available space of each location. Units were delivered and installed in five locations by the vendor over time: the first location was the DOC Men's facility in May 2022. All five were accessible by May 2023. The cost to build the PHVMs at the time they were deployed was \$11,000. The PHVMs are smart vending machines with integrated back-end software that enables cloud-based real-time inventory monitoring, generating reports, and receiving alerts if products are low.

The items in the PHVM include: nasal naloxone kit (2 doses), fentanyl test strips kit, wound care kits, safer sex kits (condoms and lubricant), nicotine replacement therapy products (NRT), hygiene kits (shampoo, soap, deodorant, shaving supplies, etc. or menstrual kits with pad, tampon, wipes, etc.), ponchos, and a local health resource guide. The resource guide was developed specifically for individuals involved in the criminal-legal system and lists tobacco and substance use-related support; housing and employment; clothing, food, and hygiene; mental and behavioral health; women's health; healthcare and wound care; and sexual health. Before the PHVMs, the two DOC facilities made naloxone available for individuals leaving incarceration through self-service lockers just before exiting the facility.

The PHVMs are intended to be a low barrier point of care; individuals do not need to register to be able to dispense the items inside. The two DOC locations have a generic code that someone who is accessing the machine enters, then they can select any one item. Each P&P location has two codes, one generic code that anyone can use to dispense any item except NRT, and another that only staff members use, which can dispense all items including NRT. The generic codes are posted on signs in the area of the machine and on the machine (with instructions for how to access NRT by reaching out to a staff member or officer where applicable). At all locations, individuals can re-enter a code to select another item.

#### 2.4. Measures and analysis

The primary outcome was the number of items distributed by the machines across all product types. The machine records the date and time, code used, and product dispensed. To support anonymity and encourage use, only data about the items distributed are tracked. Per transaction, no data about the individual accessing the machine is recorded and only one item can be taken per code entered. Given this process, we are not able to assume that items taken closely together in time were taken by the same individual. The community organization that tracks and maintains inventory combines and summarizes the utilization data across the five vending machines monthly. All distributions are recorded so no sampling was required. This study serves as a process evaluation to describe the utilization patterns across types of products, across locations, and over time. Analytic methods include descriptive statistics, chi-square, and *t*-tests. Subgroups analyzed include the DOC compared to P&P sites.

The research team also conducted key informant interviews with the supervisors at three of the sites solely for program evaluation purposes to provide additional context to the quantitative findings and

understand if they had encountered any previously unknown challenges in the first year of implementation. The research team invited all supervisors at all locations that hosted PHVMs to be interviewed, and all completed the interview.

Permission to conduct the evaluation and speak with staff members was granted by the RI DOC. Because the PHVM data is not associated with individuals and is therefore not human subjects research and the project was solely intended to serve as program evaluation, Institutional Review Board approval was not required.

### 3. Results

#### 3.1. Outcomes of the intervention

Between May 2022 and February 2024, the vending machines distributed 3720 items. Of the total, 45 % were distributed at the two DOC locations (*n* = 1670) and 55 % were distributed at the three P&P offices (*n* = 2050). See Table 1. Overall, most items fell into the "Basic Needs" category (*n* = 2803) compared to Overdose Prevention (*n* = 451) and Infection Prevention (*n* = 466). Hygiene kits were the most frequently dispensed item overall (28 %) and at P&P offices (34 %), while NRT was the most frequently dispensed at DOC (26 %) and second most overall (19 %). Ponchos were another frequently dispensed item (17 % overall).

We compared the number of items distributed each month by type of location, for months with at least one item distributed. See Table 2. Overall, there were no significant differences between the 35 months of distribution data for DOC and 35 months of data for P&P. However, when analyzing the item categories, significant differences emerged for the Basic Needs items category (excluding NRT; we analyzed NRT separately because it is dispensed differently from the other items in the PHVMs). P&P locations (*M* = 39.3, *SD* = 24.4) compared to DOC locations (*M* = 20.6, *SD* = 12.6) distributed significantly more Basic Needs items each month (*t*(51) = -4.02, *p* < 0.001).

Because each item dispensed has a unique time stamp accurate to the minute, it is possible to analyze the distribution timing. To examine distribution patterns by the day of the week, a chi-square test revealed a significant relationship by location category  $\chi^2(6, N = 3720) = 541.47, p < .001$ . Overall, more items were distributed Monday to Friday than on the weekend, and Wednesday was the most frequent day. See Fig. 1. (DOC locations were accessible throughout the week from Sunday to Saturday, while P&P offices were accessible from Monday to Friday.)

To examine distribution patterns by the time of day, a chi-square test revealed a significant relationship by location category  $\chi^2(21, N =$

**Table 1**  
Items distributed by type, for DOC and Probation/Parole locations and overall.

Type of Item		DOC	P&P	Total
		n (%)	n (%)	n (%)
Overdose Prevention	Naloxone	134 (8.0 %)	87 (4.2 %)	221 (5.9 %)
	Fentanyl Test	120 (7.2 %)	110 (5.4 %)	230 (6.2 %)
Infection Prevention	Wound Care	78 (4.7 %)	170 (8.3 %)	248 (6.7 %)
	Kit			
Basic Needs	Safer Sex Kit	187 (11.2 %)	31 (1.5 %)	218 (5.9 %)
	Hygiene Kit	352 (21.1 %)	699 (34.1 %)	1051 (28.3 %)
	Poncho	252 (15.1 %)	364 (17.8 %)	616 (16.6 %)
	Pregnancy Test	19 (1.1 %)	158 (7.7 %)	177 (4.8 %)
	Resource Guide	99 (5.9 %)	154 (7.5 %)	253 (6.8 %)
	NRT	429 (25.7 %)	277 (13.5 %)	706 (19.0 %)
Total		1670 (100.0 %)	2050 (100.0 %)	3720 (100.0 %)

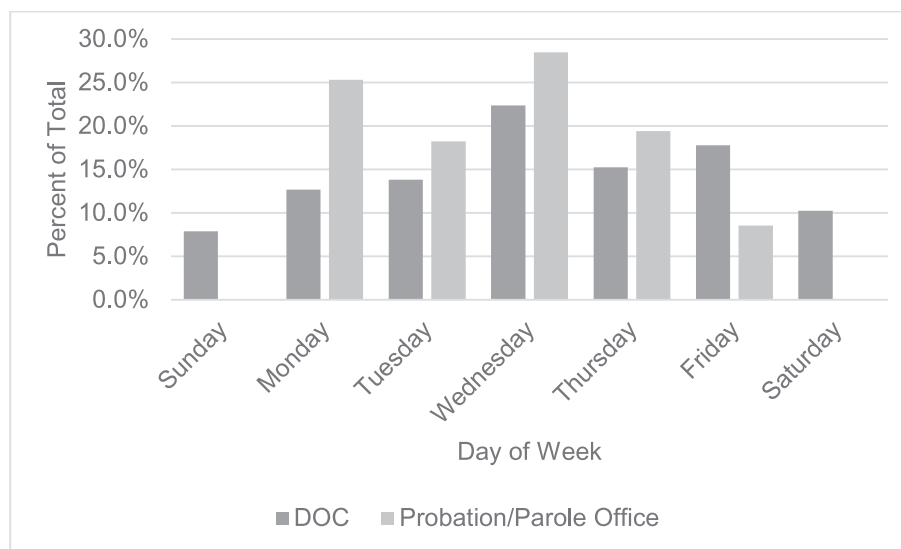
**Table 2**  
Comparison of monthly item distribution between DOC and Probation/Parole locations.

Type of item	Mean (SD)		Mean difference (95 % CI)	t-statistic (df)	P-value (two-sided)
	DOC (n = 35)	P&P (n = 35)			
Overdose prevention	7.3 (6.67)	5.6 (4.27)	1.6 (-1.1, 4.3)	1.22 (58)	0.229
Infection prevention	7.6 (7.29)	5.7 (5.29)	1.8 (-1.2, 4.9)	1.20 (62)	0.234
Basic needs (no NRT)	20.6 (12.60)	39.3 (24.43)	-18.7 (-28.0, -9.3)	-4.02 (51)	<0.001
NRT only	12.3 (13.09)	7.9 (3.94)	4.3 (-0.3, 9.0)	1.88 (40)	0.067
Total	47.7 (32.15)	58.6 (33.24)	-10.9 (-26.5, 4.7)	-1.39 (68)	0.169

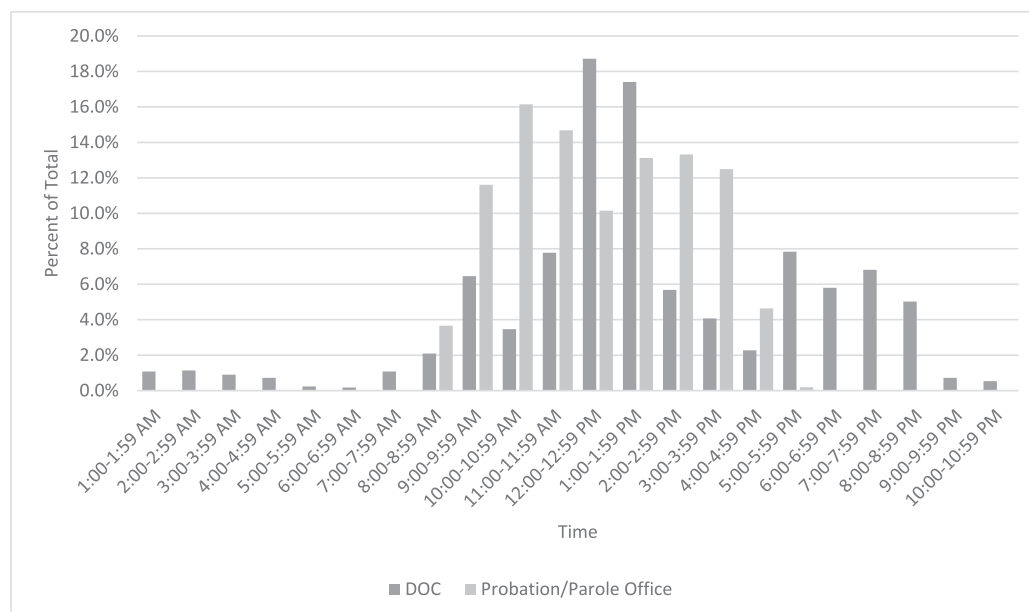
3720) = 1060.47,  $p < .001$ . Overall, 95 % of items were distributed between 8:00 AM and 7:59 PM. See Fig. 2. (P&P offices were accessible during regular business hours from 8:00 AM to 5:00 PM, DOC facilities were always accessible).

**3.2. Key informant interview results**

The evaluation conducted key informant interviews with supervisors of the three P&P offices where PHVM were located ( $n = 3$  supervisors). The supervisors provided feedback on the facilitators of implementing PHVM in P&P offices, their perception of utilization patterns when provided with preliminary distributions of products taken from the machines, and challenges associated with the PHVM that arose in this unique setting. Data provided during these key informant interviews were analyzed using a combination of rapid qualitative methods (Morgan, 1993) and thematic analysis (Braun & Clarke, 2006; Hewitt-Taylor, 2001). Two researchers took detailed notes per interview. Upon



**Fig. 1.** Item distribution by day of week.



**Fig. 2.** Item distribution by time of day.

the interview's completion, concepts that emerged from the conversation were discussed, compared, and synthesized across interviews. This process was done for data collected from the three key informants.

### 3.3. Implementation facilitators

Supervisors discussed several factors that helped facilitate the PHVM design and implementation process in P&P settings. Every person who held a supervisory position within the RI correctional system were made aware of the PHVM implementation when it occurred (i.e., introduced during supervisory meeting), regardless of whether they worked within P&P, which enhanced visibility of the machines among criminal-legal staff. The supervisors were supportive of the implementation of the PHVM at their offices, and felt the machines were aesthetically pleasing and were often placed at appropriate physical spaces within their office lobby. Regarding products within the machine, it was helpful that the staff and supervisors were already familiar with some harm reduction resources (i.e., naloxone).

### 3.4. Utilization patterns and needs

Supervisors shared their perspectives on utilization patterns among the intended population and suggested ways to enhance use of the machines. At the time of the PHVM implementation, naloxone was already available "everywhere" in the community including at the P&P offices. However, the supervisors were supportive of increasing "low barrier" access to naloxone through these PHVM. Since the implementation of the machines, the supervisors' perception was that individuals on probation, people accompanying them, and the general public were using the machines frequently. Supervisors perceived it was reasonable that supplies for basic needs (e.g., hygiene kits, ponchos) were utilized especially often among this population and thought that additional basic supplies would be valuable because a high proportion of individuals are unhoused (bars of soap, tissue packs, emergency blankets). To enhance the use of some items that were infrequently utilized (e.g., safe sex kits), supervisors suggested diverse strategies to enhance use of these health-promoting items (e.g., informally discuss products with individuals, add small products like condoms to a bowl for even easier access, add another item of interest to the packet of products like gum).

### 3.5. Challenges to operations

A couple of unique challenges associated with the PHVM arose at the P&P offices. One of the P&P offices located in a high-foot traffic area experienced an issue with individuals coming in to retrieve NRT in large quantities, with the perception that they would likely re-sell it (i.e., individuals that were not P&P clients retrieving several packages of NRT from the machine at once). This challenge related to product misuse brought up concerns about safety for the office, so the supervisor at that location removed the NRT from the PHVM. NRT was still available to individuals directly from their P&P officer upon request. Since the removal of NRT from machines at that office, the office no longer experienced overutilization of the products in the machine, and the supervisor perceived the PHVM to be a positive experience aside from that challenge. The other two offices did not experience this challenge. Another concern related to product packaging was noted. In the fentanyl test kit packages, the cookers are visible to anyone looking at the machines. Individuals in recovery and their family members were reported to be triggered by the high visibility of this product, viewed as drug use paraphernalia. To address this issue, a supervisor supported altering the packaging for the fentanyl test kits such that the sleeves of the kits would be opaque and more discrete. Despite minor challenges that arose associated with the PHVM in P&P offices, supervisors and staff remained supportive of the machines, were confident that the machines would stay fixtures of their offices and anticipated that more PHVM would be implemented within the RI correctional system.

## 4. Discussion

This work demonstrates the value of having all products in the DOC PHVM available, particularly basic supplies including hygiene kits and ponchos. Social determinants of health, including the ability to access resources for basic needs like housing, food, and hygiene, exert incredible influence on health outcomes (Braveman & Gottlieb, 2014) and have been linked to overdose risk (Singh et al., 2019; Sugarman et al., 2020). The association between criminal-legal involvement and housing insecurity has been established in the literature, especially upon release. However, very few interventions in this setting provide support directly related to social determinants of health (Sugarman et al., 2020). PHVM can provide minor support for basic needs during this period, as one way to address inequities that arise due to social determinants of health. Other communities could benefit from supporting access to basic needs for individuals with criminal-legal involvement and PHVM is one mechanism to do so.

Although the harm reduction supplies including naloxone were relatively low, this is attributable to the high saturation of naloxone in the state (Zang et al., 2022). Naloxone is also available within the DOC awaiting trial lobbies for anyone to take without accessing the machines, so overall utilization is likely higher. The DOC plans to add naloxone to the exit packets or belongings upon release, which will increase the reach of naloxone and may reduce demand for it from the PHVM. The P&P supervisors were supportive of having naloxone available. However, it is also plausible that individuals may be hesitant to access harm reduction supplies at the same location as their P&P officer; one study found that young adults were cautious about accessing PHVM due to police presence (Wagner et al., 2022). Additional supplies were identified by P&P supervisors to meet basic needs (e.g., soap) and may be added to the PHVM in the future. Despite low utilization of some PHVM items (e.g., resource guide), these items will remain in the machine for access by interested individuals. Further research involving perspectives of participants would be valuable, especially in considering the diversity of products delivered from the machines and whether these resource needs differ by geographic area.

Some best practices for PHVM implementation identified via previous literature were incorporated, including having a data collection process, anonymity of use, and opportunities to share feedback between the program, participants, and community stakeholders (Russell et al., 2023). The anonymous and brief nature of the PHVM transactions in this study differ from some other models that require registration of individuals accessing the services (e.g., (Arendt, 2023)). Future implementers should consider the costs and benefits of requiring individual registration prior to PHVM use. Regarding feedback during the evaluation process, data summary results were shared with P&P stakeholders at each location with a PHVM as well as DOC leadership. A summary of the feedback received from the key informant interviews was shared with DOC leadership to support continuous improvement of the process and items available (interviewees were aware that this was the intention).

A limitation of this research is that there is no measure of whether the intended audience was reached. There was no recruitment or screening of individuals who utilized the machines to maintain the low barrier, low stigma access. Concerns about individuals outside of the intended audience using the PHVM in one particularly busy location were addressed and have also been raised in previous research (Islam et al., 2008). However, studies internationally have found no evidence of PHVM misuse (i.e., attracting individuals from outside of the target area to misuse the free supplies) (Obadia et al., 1999).

Regarding PHVM sustainability, the RI Opioid Stewardship funding supports ongoing maintenance. DOC leadership indicated that it is fairly low cost to maintain after the initial expense of the machine, and some materials are provided through other state funding mechanisms. DOC plans to increase the spread by building two additional machines for another location that houses the home confinement unit, victim services

unit, minimum supervision, and transitional services unit (for those newly released) or re-entry unit. The continued investment confirms the perceived value of the intervention and support for its implementation and spread. The PHVMs have been of value in these correctional settings to augment harm reduction services and may be especially valued in areas where such services are not readily available. Future research should assess if access to the PHVM access reduces overdoses.

#### 4.1. Conclusions

The utilization patterns of items distributed by the PHVMs in criminal-legal settings in RI demonstrate the demand for basic supplies as well as support related to harm reduction. The convenient location, anonymous nature, and free contents of the machines ensures that individuals can easily access the resources. Monitoring and summarizing utilization ensures that the vending machines remain useful to the community and facilitates transparency and communication with stakeholders. Harm reduction and public health promotion are broader than overdose prevention for individuals with criminal-legal involvement; it also includes providing resources addressing temporal needs.

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#### CRedit authorship contribution statement

**Rosemarie Martin:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Data curation, Conceptualization. **Alyssa DaCunha:** Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Formal analysis, Data curation. **Amelia Bailey:** Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis. **Raynald Joseph:** Writing – review & editing, Validation, Resources, Project administration, Data curation. **Kimberly Kane:** Writing – review & editing, Project administration.

#### Declaration of competing interest

On behalf of the other authors, Alyssa DaCunha declares that the authors have no financial/personal interest or belief that could affect their objectivity.

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