EE180

Home delivery increases viral suppression for people living with HIV but contributes 7.8 kg more CO_2 per virally suppressed person than refilling at clinics…for now!

Comparing the environmental costs of differentiated service delivery of ART for people living with HIV in rural South Africa

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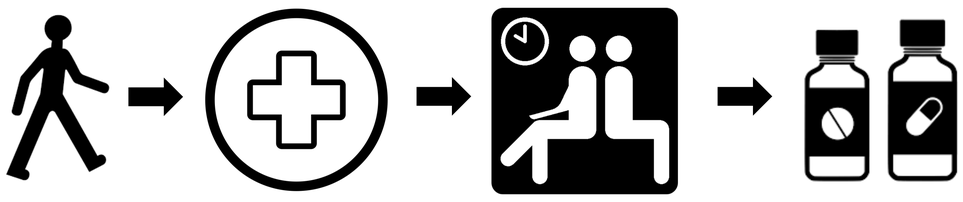
Background

- People living with HIV require reliable access to ART for life to maintain viral suppression
- Barriers to care: Long clinic waiting times, clinics being located too far away, negative experiences at clinics
  → *Can reducing these barriers increase retention in care?*

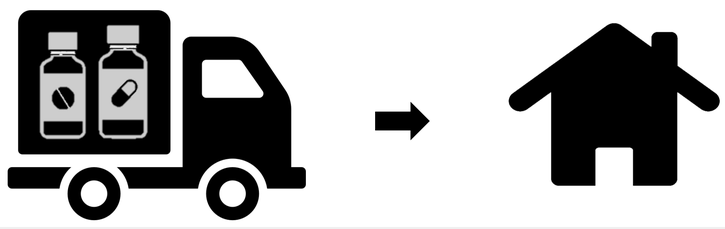
Deliver Health Study (2019-20):

Standard-of-care: Clinic-based refills



vs.

Intervention: Home-delivered refills



One step further: Can scaling up home delivery support a carbon-neutral approach by reducing overall greenhouse gas emissions from individual commuters to clinics?

Objective

To analyze carbon dioxide (CO_2) emissions data to compare environmental costs of different ART refill methods for people living with HIV.

Methods

1 Incremental cost-effectiveness ratio (ICER)

$$\frac{\left(\text{Avg. total } CO_2 \text{ emissions}_{\text{home delivery group}}\right) - \left(\text{Avg. total } CO_2 \text{ emissions}_{\text{clinic group}}\right)}{\left(\frac{n_{\text{virally suppressed in home delivery group}}}{n_{\text{home delivery group}}}\right) - \left(\frac{n_{\text{virally suppressed in clinic group}}}{n_{\text{clinic group}}}\right)}$$

2 Comparative cost-effectiveness (CCE)

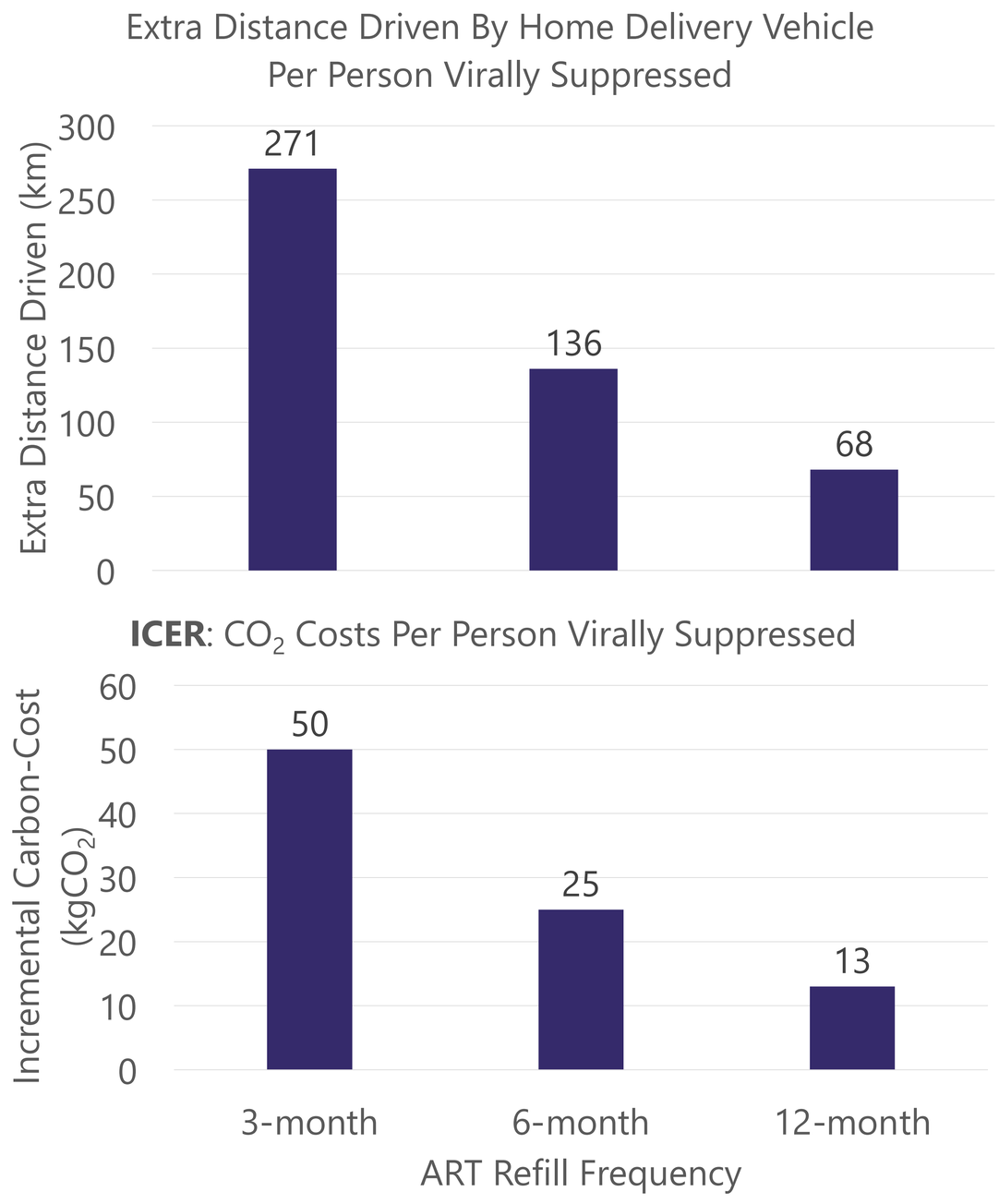
$$\left(\frac{\text{Avg. total } CO_2 \text{ emissions}_{\text{home delivery group}} * n_{\text{home delivery group}}}{n_{\text{virally suppressed in home delivery group}}}\right) - \left(\frac{\text{Avg. total } CO_2 \text{ emissions}_{\text{clinic group}} * n_{\text{clinic group}}}{n_{\text{virally suppressed in clinic group}}}\right)$$

Results

Table 1. Characteristics of people living with HIV in the Deliver Health Study

Characteristic	Clinic (N=73)	Home Delivery (N=80)	Total (N=153)
	mean (SD) or n (%)		
Age (years)	35.6 (8.5)	38.8 (9.3)	37.3 (9.1)
Men	38 (52.1)	44 (55.0)	82 (53.6)
Employed	26 (35.6)	33 (41.3)	59 (38.6)
Individuals known to be living with HIV	51 (69.9)	52 (65.0)	103 (67.3)
Past ART use (among individuals known to be living with HIV, n=103)			
Currently on ART	48 (65.8)	50 (62.5)	98 (64.1)
Taken ART in the past	2 (2.7)	1 (1.3)	3 (2.0)
Never taken ART	23 (31.5)	29 (36.3)	52 (34.0)
Virally suppressed (<20 copies per mL) at month 12	54 (74.0)	70 (87.5)	124 (81.0)
Mode of transportation to ART refill visit			
Walking	47 (64.4)	--	47 (30.7)
Minibus/Taxi	24 (32.9)	--	24 (15.7)
Driving	2 (2.7)	--	2 (1.3)
Delivery vehicle (2016 Ford Ranger Diesel 4x4)	--	80 (100.0)	80 (52.3)
Total distance travelled to refill visit per participant (km)	7.3 (13.3)	6.3 (5.1)	6.8 (9.8)
Cumulative CO_2 emissions across all refill visits over study follow-up per participant ($kgCO_2$)	0.4 (0.6)	7.3 (8.2)	0.4 (0.7)

Comparing home-delivered to clinic-based refills:



- **CCE**: Compared to the clinic group, home delivery cost an extra 7.8 kg of CO_2 emissions per person virally suppressed

In rural South Africa, incremental CO_2 emissions were higher for people living with HIV receiving home-delivered vs. clinic-based ART refills but **could be reduced by 6- or 12-month refills and/or changing number of deliveries or vehicle type.**

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