

Opioid agonist treatment and prevention of HCV transmission among people who inject drugs:

Importance of clinically-recommended and patient-perceived dosage adequacy

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Acknowledgements

- **ALL HEPACO PARTICIPANTS**
- **RESEARCH TEAM:** Julie Bruneau, Didier Jutras-Aswad, Élise Roy, Geng Zang, Lise Gauvin, Emmanuel Fortier, Nanor Minoyan, Brendan Jacka, Stine Høj, Iuliia Makarenko
- **HEPACO COHORT TEAM:** Rachel Bouchard, Elisabeth Deschenes, Maryse Beaulieu, Elyse Boucher, Serge Côté, Sira Diarra, Marie-Lyne Girard, Marie-Eve Turcotte, Yanie Nam, Isabelle Boisvert

PhD Scholarships



HEPACO Cohort Funding

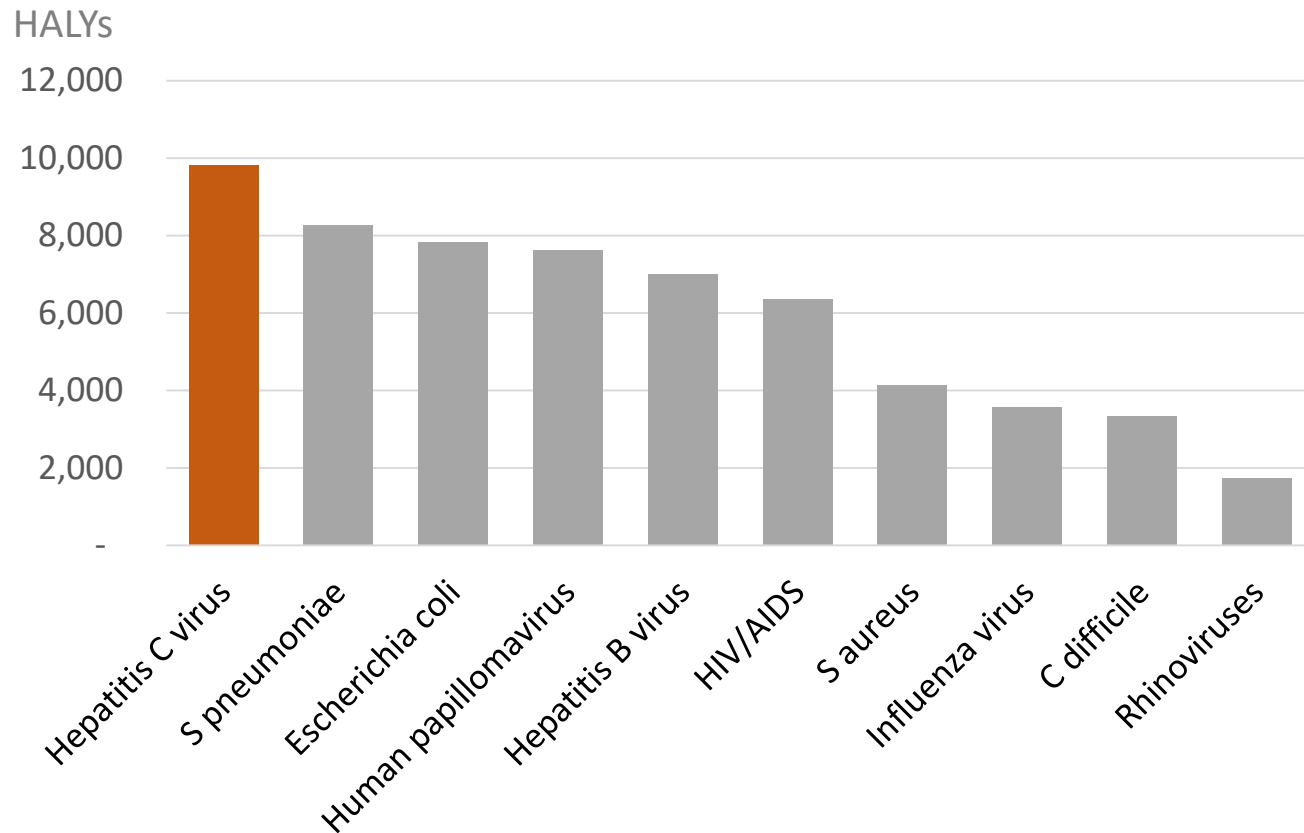


Disclosure of interest

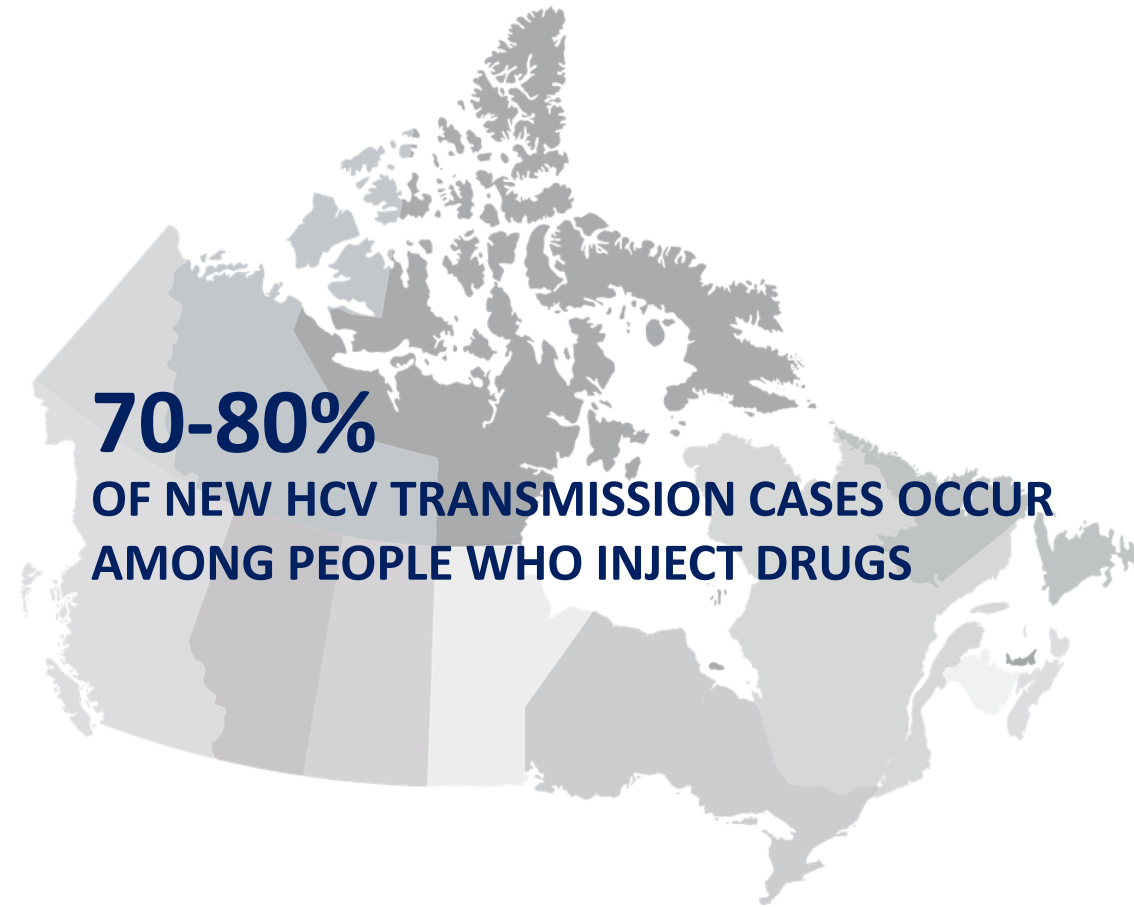
Julie Bruneau receives advisor fees from Gilead Sciences and Merck and a research grant from Gilead Sciences, outside of this current work.

Context: Hepatitis C in Canada

Health-adjusted life years for the top 10 ranked infectious diseases or pathogens, 2005-07, Ontario, Canada.



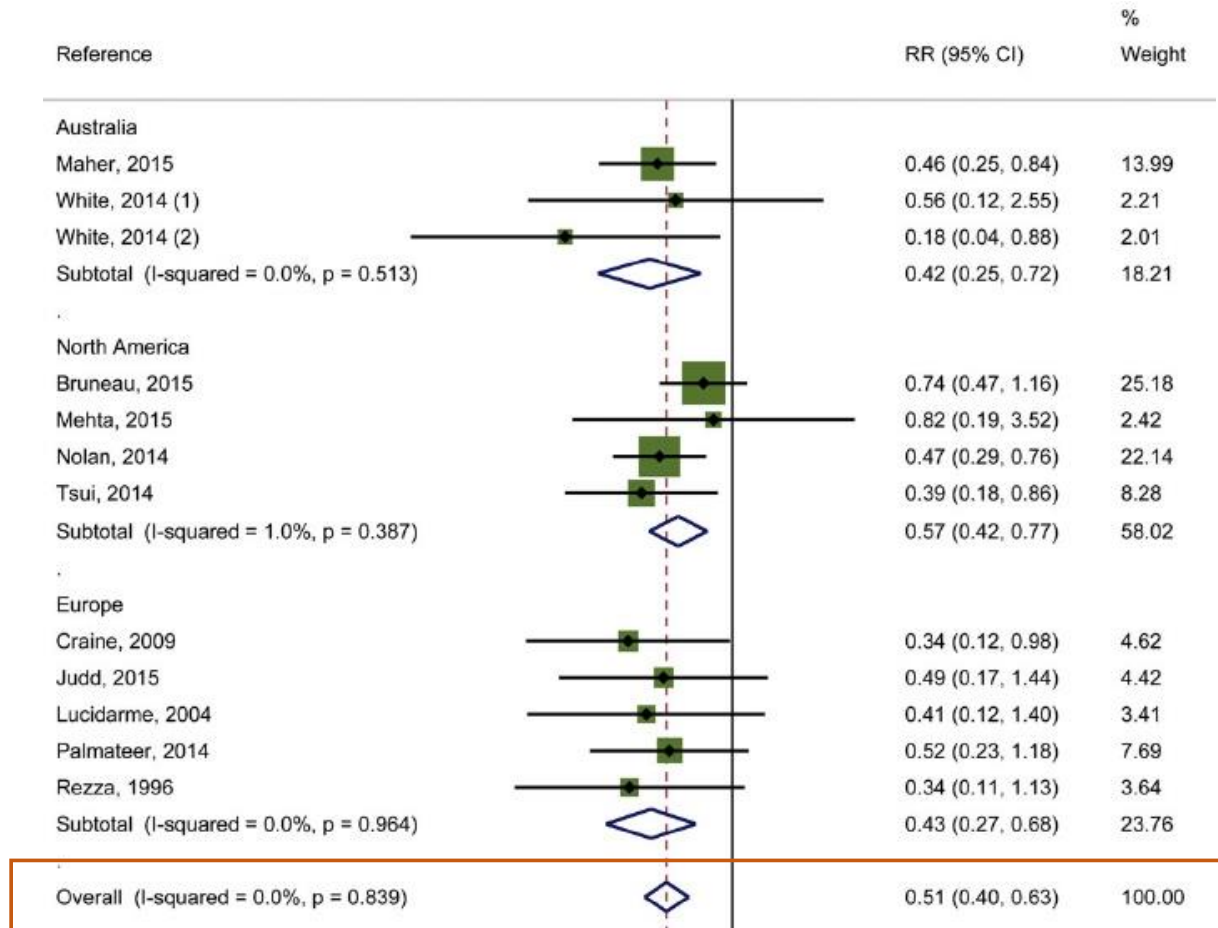
Kwong et al *PLoS One* 2012



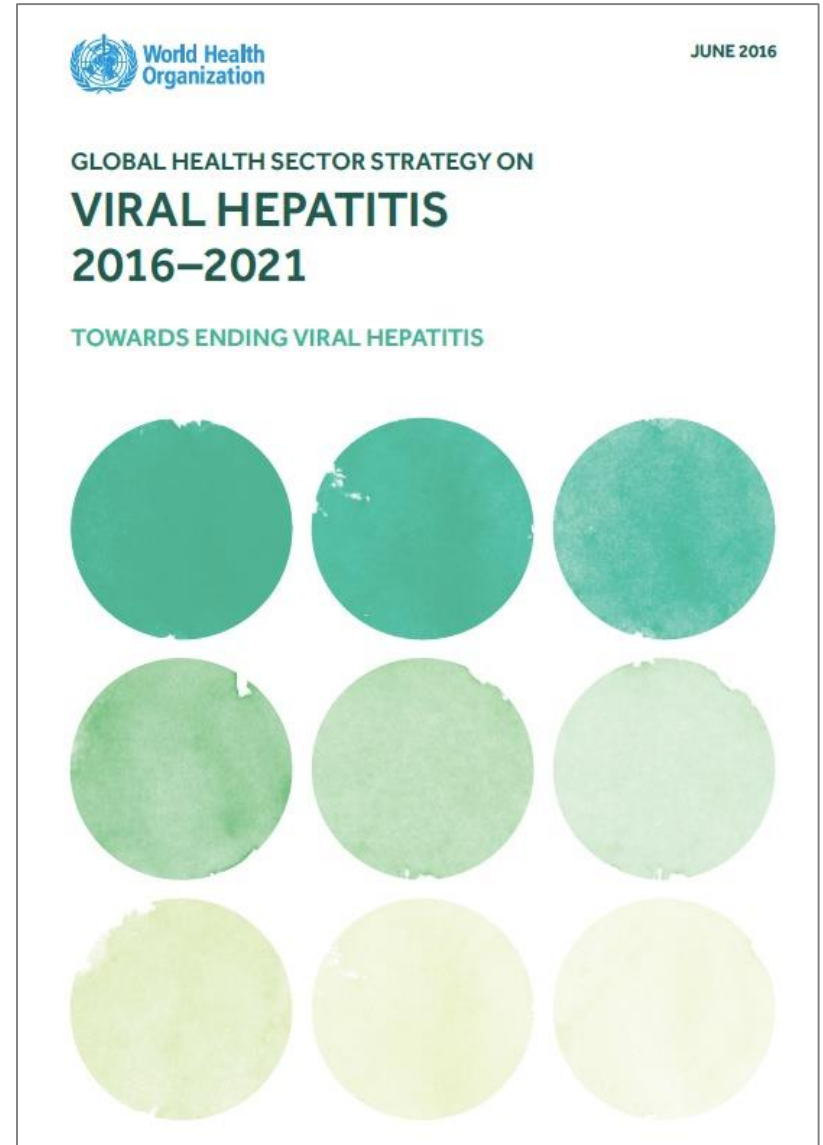
PHAC CCDIC 2011

Opioid agonist treatment (OAT) as a « gold-standard » approach in the prevention of HCV among people who inject drugs

Impact of current OAT use versus no OAT on HCV transmission:
Findings from a Cochrane Review and meta-analysis



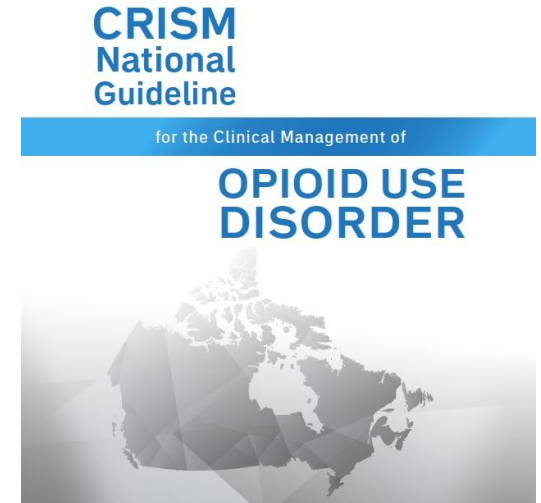
Platt L et al Addiction 2018



OAT for HCV prevention

What role does OAT dosage play?

- According to clinical guidelines for the management of opioid use disorders, in most patients, greater treatment outcomes are seen with higher doses:
 - Methadone: $\geq 60\text{mg/day}$
 - Buprenorphine: $\geq 16\text{mg/day}$
- Patients' subjective perceptions of their level of comfort with their dose of OAT is another element that can inform dosing decisions, and has been linked to greater retention in treatment.



Bruneau J et al *CMAJ* 2018

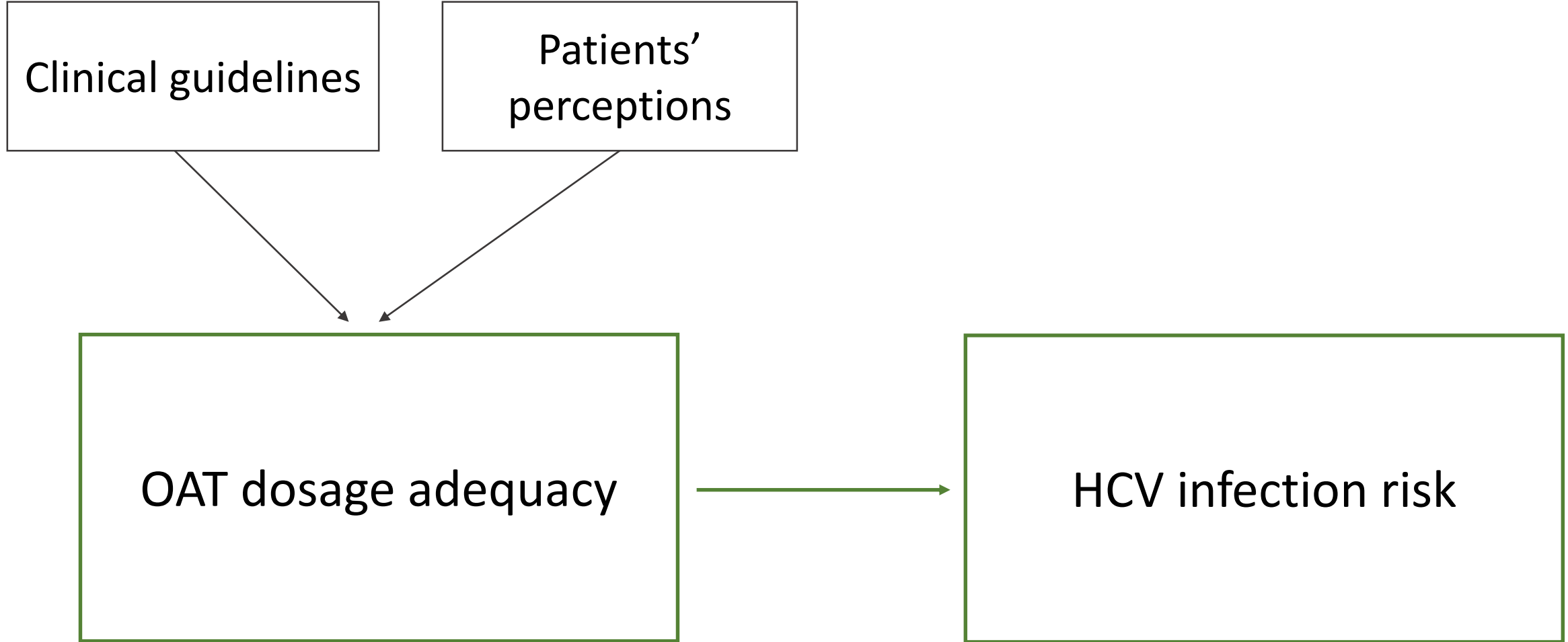
Objective

Clinical guidelines

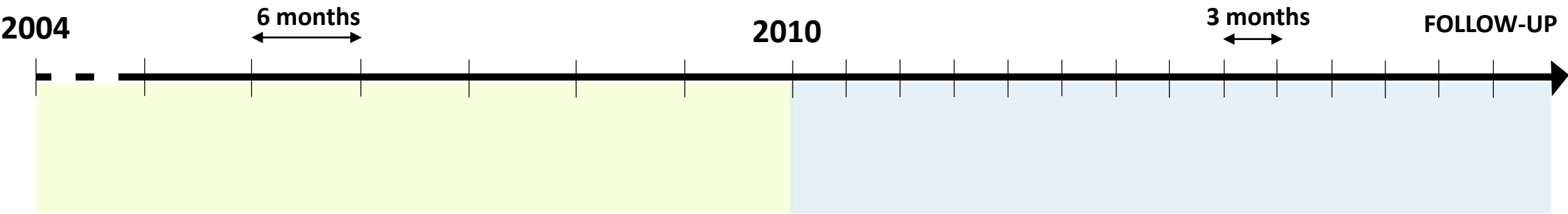
Patients'
perceptions

OAT dosage adequacy

HCV infection risk

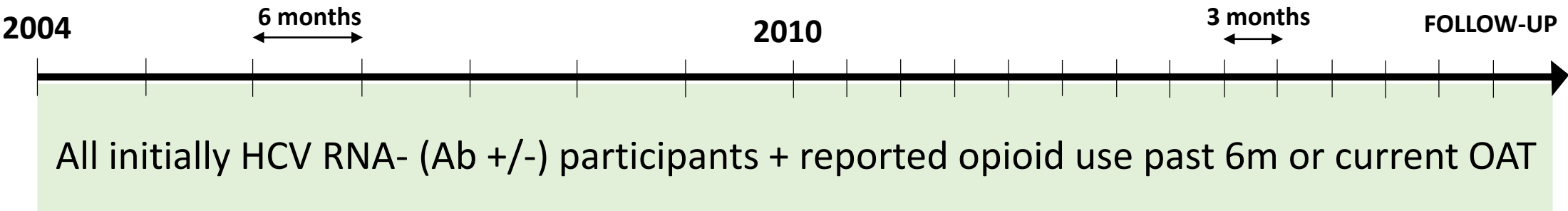


HEPatitis COhort (HEPCO)



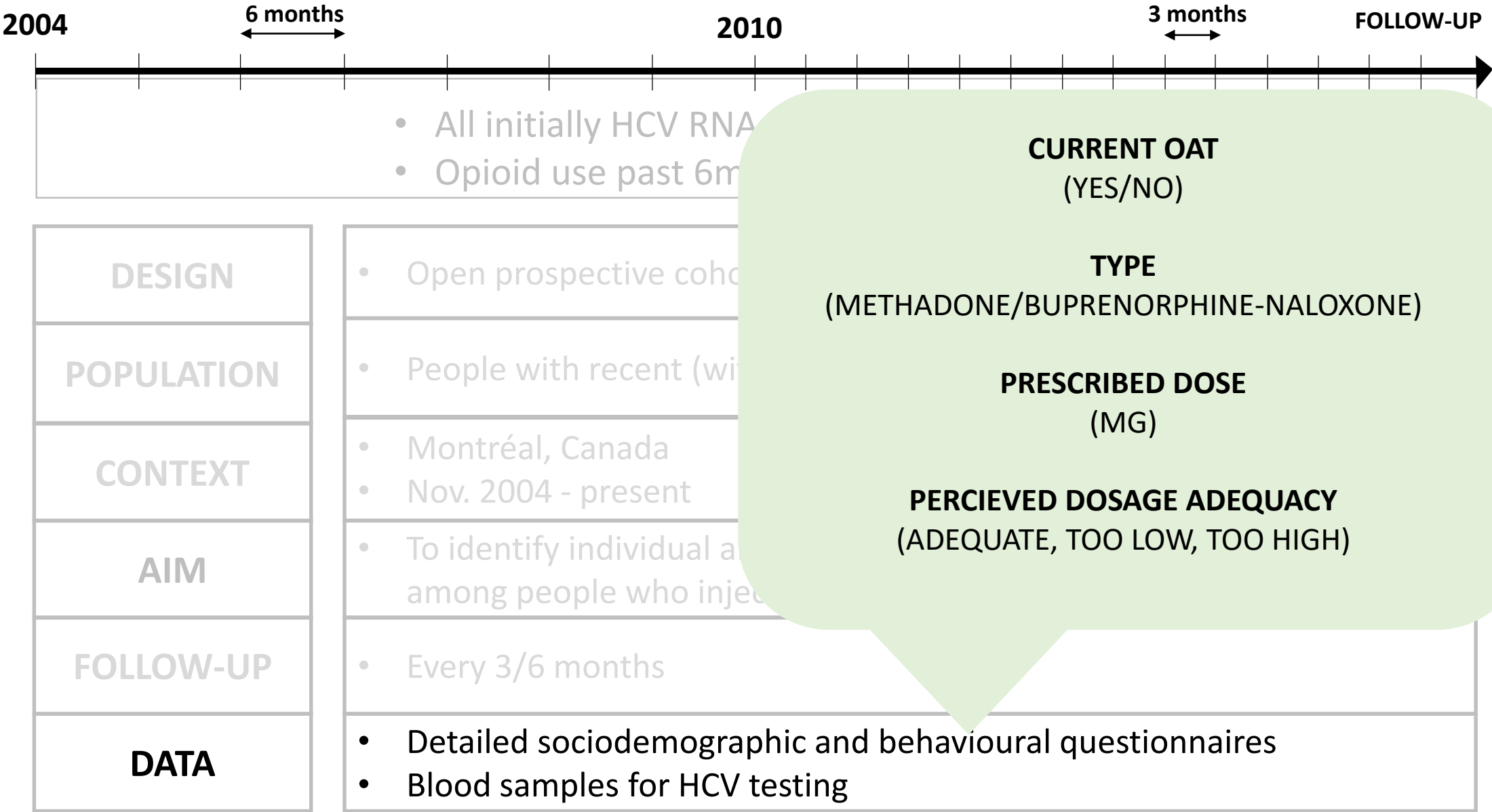
DESIGN	<ul style="list-style-type: none">• Open prospective cohort
POPULATION	<ul style="list-style-type: none">• People with recent (within past 6m) injection drug use, aged ≥ 18
CONTEXT	<ul style="list-style-type: none">• Montréal, Canada• Nov. 2004 - present
AIM	<ul style="list-style-type: none">• To identify individual and contextual determinants of HCV infection among people who inject drugs
FOLLOW-UP	<ul style="list-style-type: none">• Every 3/6 months
DATA	<ul style="list-style-type: none">• Detailed sociodemographic and behavioural questionnaires• Blood samples for HCV testing

POPULATION: CURRENT STUDY



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DATA: EXPOSURE VARIABLE MEASUREMENT



Exposure variable definition (5 levels)

CURRENT OAT

		<u>PATIENTS' PERCEPTIONS</u>	
		ADEQUATE	INADEQUATE
<u>CLINICAL GUIDELINES</u>	HIGH	HIGH DOSE & PERCEIVED ADEQUATE	HIGH DOSE & PERCEIVED INADEQUATE
	LOW	LOW DOSE & PERCEIVED ADEQUATE	LOW DOSE & PERCEIVED INADEQUATE

*Inadequate defined as:
too low or too high
(combined)*

NO CURRENT
OAT

*High defined as:
Methadone: ≥ 60 mg/day
Buprenorphine: ≥ 16 mg/day*

Outcome variable definition and statistical analyses

OUTCOME VARIABLE:

HCV INFECTION defined as primary infection or re-infection

STATISTICAL ANALYSES:

COX REGRESSION ANALYSES extended to time-varying exposures to estimate HR and 95% CI

- Confounding factors considered: duration of injection, gender, recent incarceration, recent unstable housing, previous HCV infection, follow-up period
- Final model selection: Change-in-estimate procedure

RESULTS

Characteristics of study sample at baseline assessment (N=513)

36
years

MEAN
AGE



12
years

MEAN DURATION
OF INJECTION



78%

51%

COCAINE IV, PAST MONTH



36%

UNSTABLE
HOUSING

73%

OPIOIDS IV, PAST MONTH



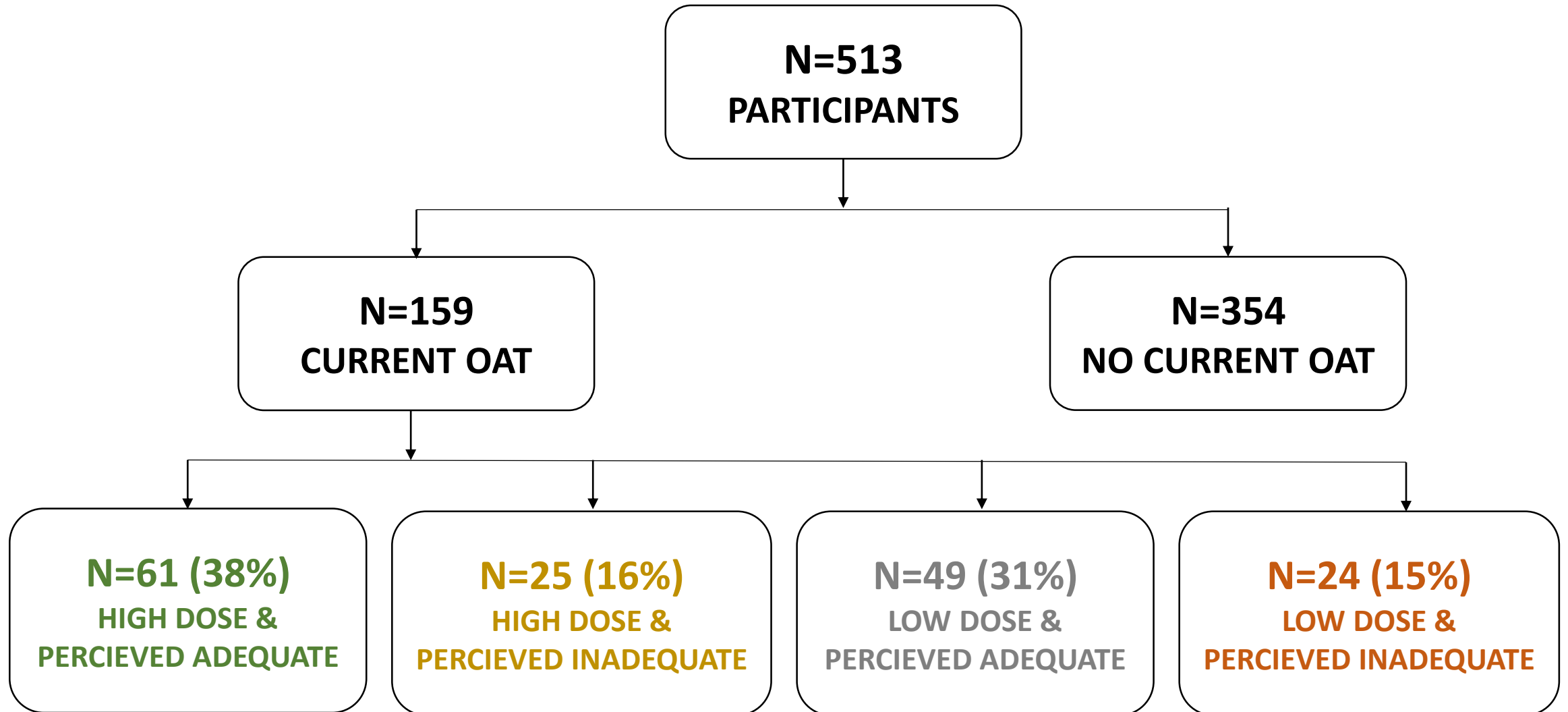
21%

RECENT
INCARCERATION

55%

>30 INJECTIONS/MONTH

OAT dosage adequacy at baseline assessment



Follow-up and HCV incidence

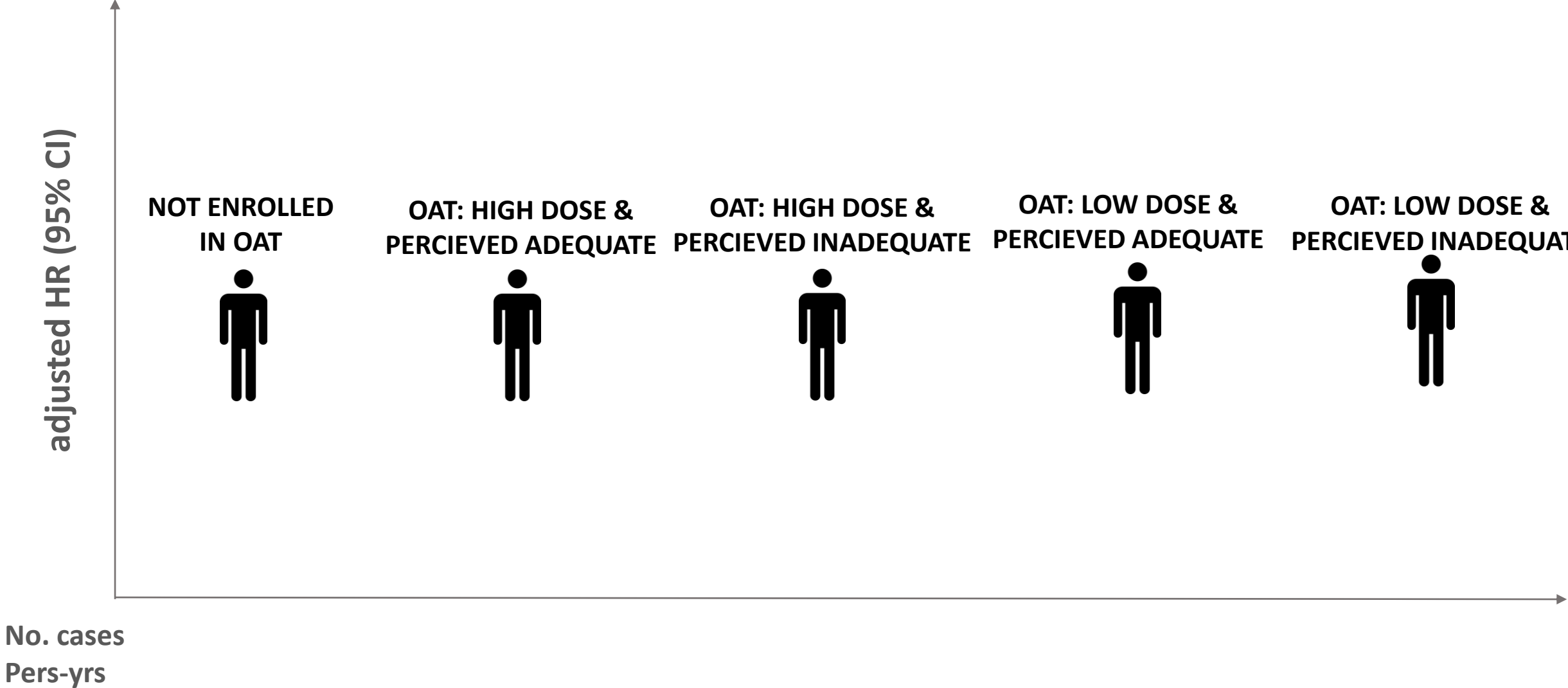
513 participants



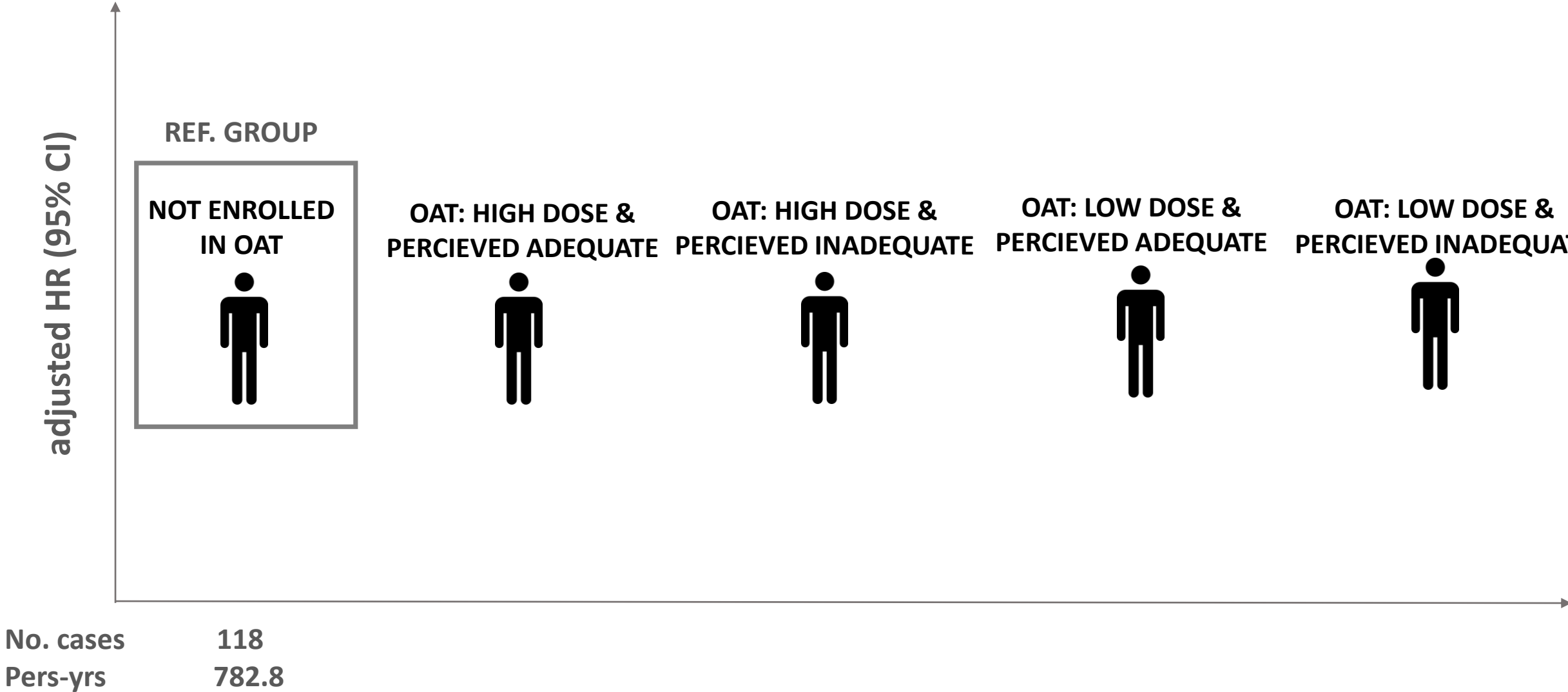
**3429
observations**

- TOTAL NO. OF NEW CASES OF HCV INFECTION: 168
- TOTAL PERSON-YEARS OF FOLLOW-UP: 1422.6
- **HCV INCIDENCE: 11.8 PER 100 PERSON-YEARS**

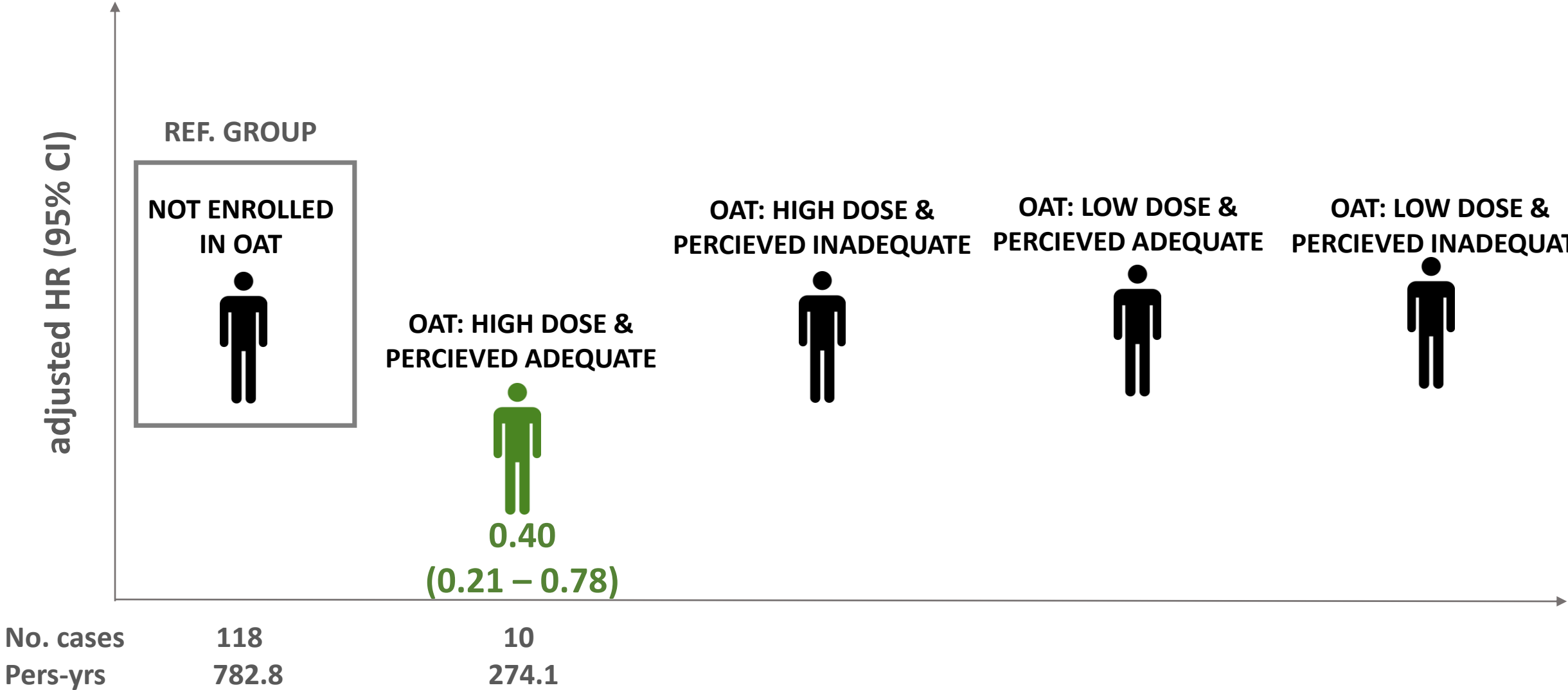
Association between OAT dosage adequacy and risk of HCV infection among people who inject drugs



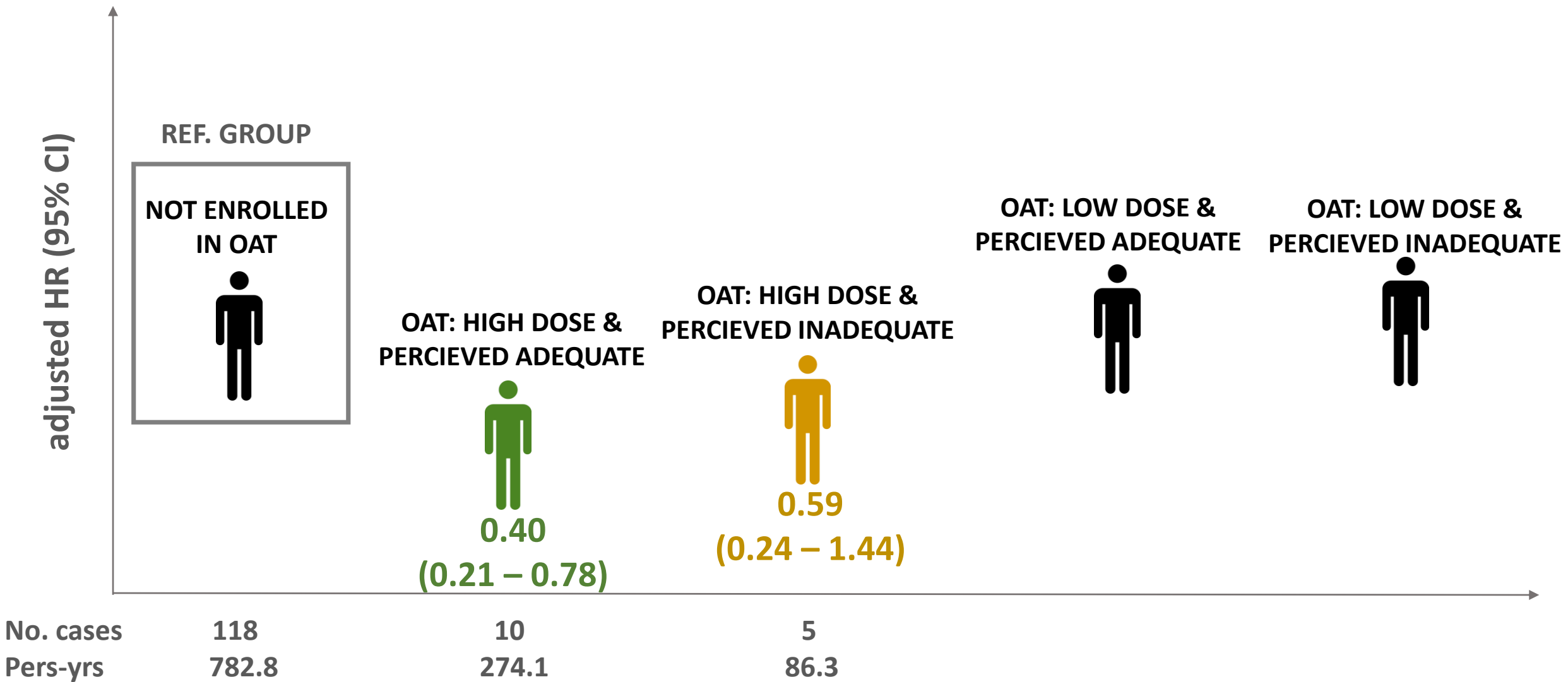
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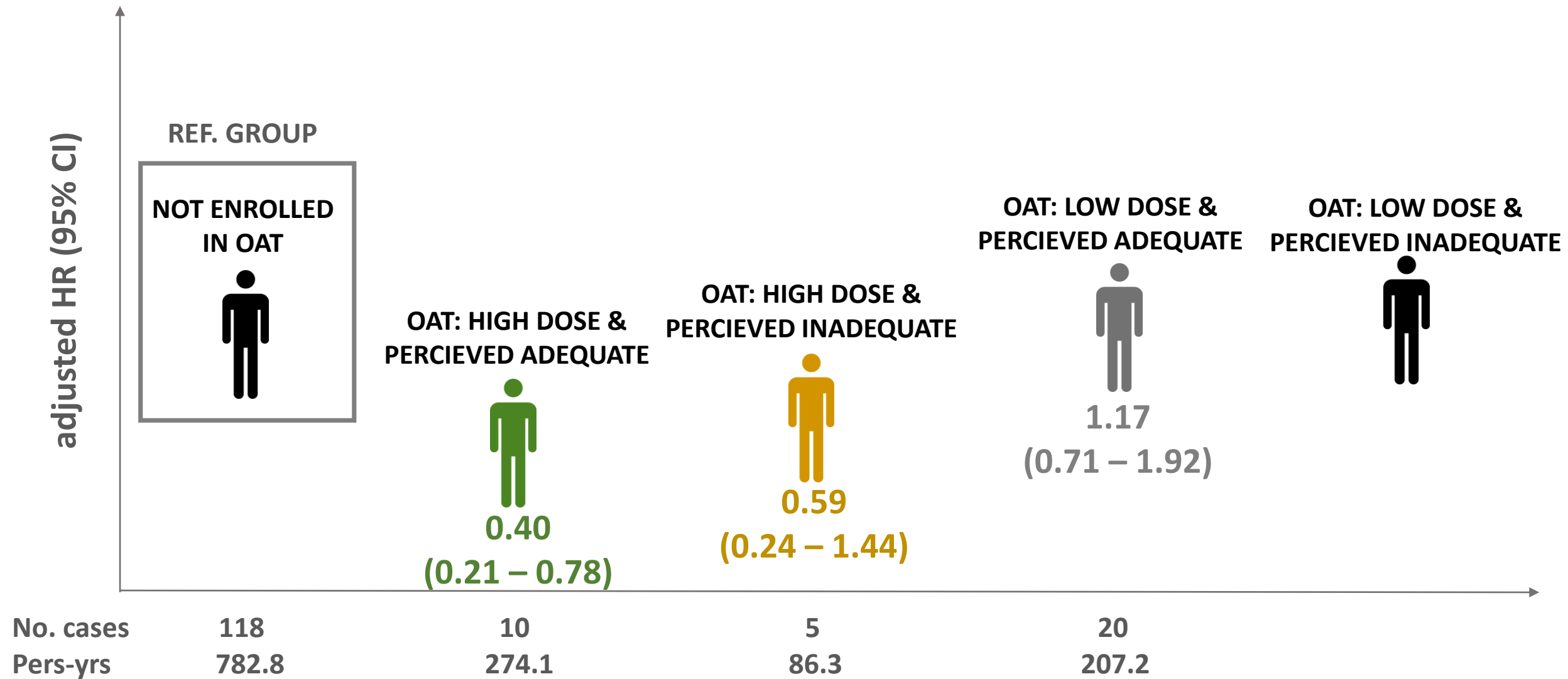
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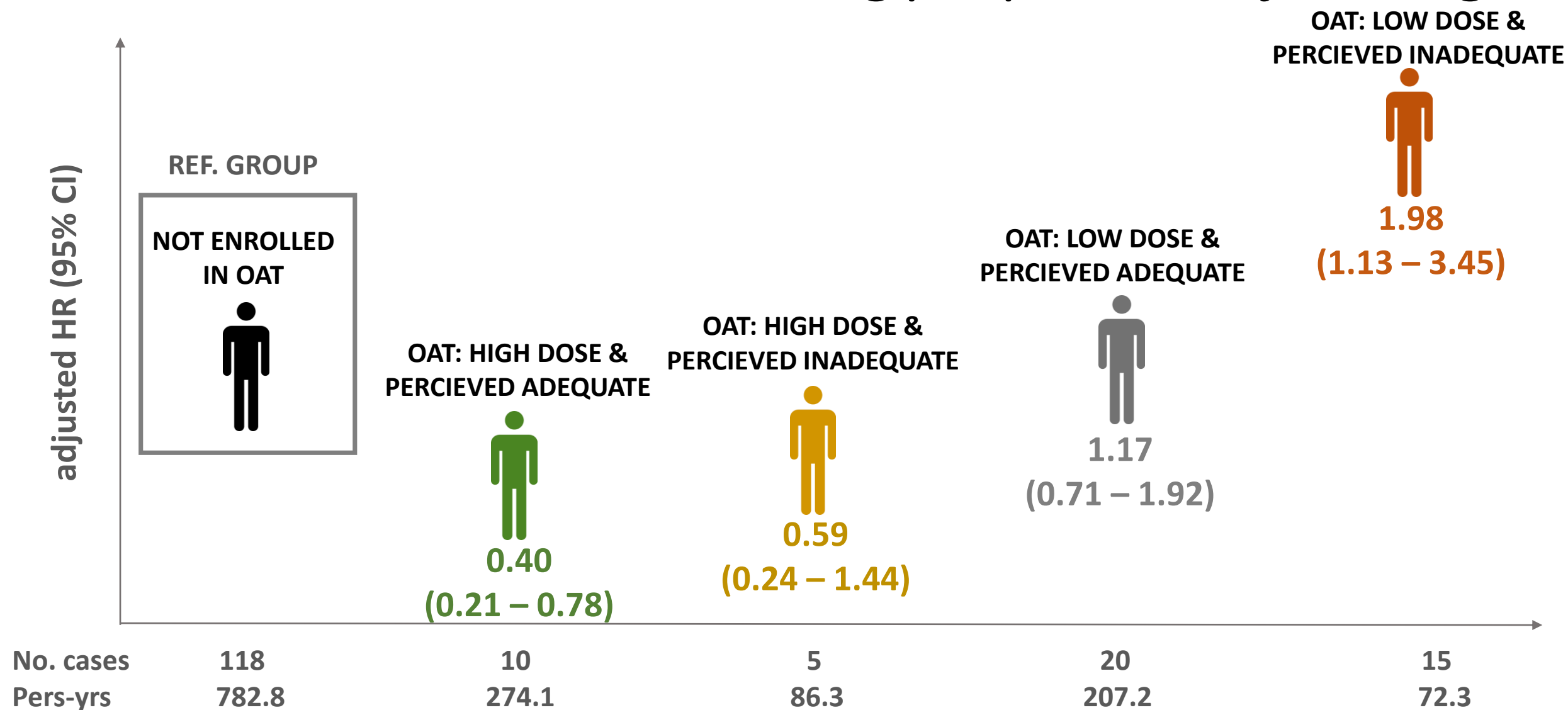
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Main finding and implications

- **HCV infection risk varies considerably according to OAT dosage among PWID.** From an HCV prevention perspective, being on OAT may not be enough to confer a prevention benefit; a high OAT dose is needed

Main finding and implications

- **HCV infection risk varies considerably according to OAT dosage among PWID.** From an HCV prevention perspective, being on OAT may not be enough to confer a prevention benefit; a high OAT dose is needed
- Public health guidelines on HCV prevention/elimination should consider the importance of OAT dosage, not just uptake
- Ensure that OAT programs provide care following best-practice guidelines and that clinicians work with patients **to identify a suitable dose that is most likely to be clinically effective while meeting their needs**

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Association between OAT dosage adequacy and risk of HCV infection among people who inject drugs

Variable	unadjusted HR (95% CI)	adjusted HR (95% CI)
OAT dosage adequacy (Ref: not enrolled in OAT)		
High OAT dose and perceived adequate	0.28 (0.15 - 0.54)	0.40 (0.21 - 0.78)
High OAT dose and perceived inadequate	0.43 (0.17 - 1.05)	0.59 (0.24 - 1.44)
Low OAT dose and perceived adequate	0.79 (0.49 - 1.28)	1.17 (0.71 - 1.92)
Low OAT dose and perceived inadequate	1.46 (0.85 - 2.50)	1.98 (1.13 - 3.45)
Age, years	0,83 (0,76 - 0,90)	-
Male gender	1,00 (0,69 - 1,45)	0.86 (0.59 - 1.27)
College education or higher	0,55 (0,37 - 0,82)	-
Duration of injection, years	0,79 (0,72 - 0,87)	0.84 (0.76 - 0.93)
Unstable housing, past month	2,34 (1,72 - 3,17)	2.45 (1.77 - 3.39)
Incarceration past 3/6 months	2,32 (1,65 - 3,27)	-
Previous HCV infection	0,43 (0,29 - 0,64)	0.67 (0.43 - 1.05)
2011-2017 follow-up (vs. 2004-2017)	0,64 (0,47 - 0,87)	-

Proportion of visits with OAT at prior visit, if current OAT

OAT dosage adequacy	Methadone
Low OAT dose and perceived adequate	416 (89,3%)
High OAT dose and perceived adequate	495 (94,3%)
Low OAT dose and perceived inadequate	170 (86,7%)
High OAT dose and perceived inadequate	146 (91,8%)

Prescribed dose, by OAT dosage adequacy

		Methadone		Buprenorphine		
	No. of observations	Median (IQR)	Min, Max	No. of observations	Median (IQR)	Min, Max
Low OAT dose and perceived adequate	522	40 (30 - 50)	1 - 60	67	10 (6 - 14)	2-16
High OAT dose and perceived adequate	579	95 (75 - 130)	61 - 370	5	22 (20 - 28)	18-32
Low OAT dose and perceived inadequate	222	40 (30 - 50)	3 - 60	15	8 (4 - 10)	2-16
High OAT dose and perceived inadequate	182	90 (70 - 112,5)	62 - 420	6	19 (18 - 20)	18-28