

## Abstract

**Aims:** To evaluate the effectiveness and the cost of 6 months of a clinic-based opiate integrated treatment program (methadone (MET) or buprenorphine/naloxone (Bup/Nx) and counseling sessions) implemented within an HIV clinic at Go Vap clinic, Ho Chi Minh City, Vietnam since December 2013.

**Methods:** We have used has been performed using data collected by the Drug Abuse Treatment Cost Analysis Program (DATCAP) for the economic evaluation, and questionnaire and clinical files for the effectiveness analyses. We have compared three modalities of treatment dosing: MET daily, Bup/Nx daily, and Bup/Nx thrice weekly dosing.

**Results:** The sample consisted of 316 participants (228 receiving MET and 88 Bup/Nx), mainly males (96.8%), 32.2 y.o. (SD= 6.4). At 6 months, the retention rate was 88.6% (36 participants dropped out of the program), with a better retention for participants in MET (94.4%) than Bup/Nx (70.4%) ( $\chi^2=2.80$ ,  $p<0.0001$ ) but not when Bup/Nx is delivered three time per week. The opiate treatment medication adherence rate was high (94.2%) and was better for MET than Bup/Nx ( $\chi^2= 285.0$ ,  $p<0.0001$ ) but not significant anymore when Bup/Nx was delivered on thrice weekly dosing schedule ( $\chi^2= 0.39$ ,  $p= 0.53$ ). There was a significant decrease of heroin use regardless of the treatment received ( $F(2,292)=17.4$ ,  $p<0.0001$ ), and participants in Bup/Nx decreased or stopped their heroin use sooner than MET participants ( $F(2,292)= 0.3$ ,  $p<0.0001$ ). The total cost of the integrated treatment with Bup/Nx is higher than the one with MET (US\$3,039 vs. US\$1,560), however, the total cost was mainly driven by the cost of the medication. When Bup/Nx treatment is taken every-other day the cost of treatment delivery is almost half as expensive as for MET (US\$948.22 versus US\$405.86).

**Conclusion:** Both integrated treatment with MET and Bup/Nx were effective. The cost of the program is mainly driven by the cost of the medication. A thrice weekly dosing schedule for Bup/Nx treatment reduces the cost of Bup/Nx treatment and increases its effectiveness.

## Background

- Vietnam:**
  - 271,000 people using drugs (UNAIDS 2015)
  - 14,000 new HIV infections in 2015, and most of them are driven by injecting opiates
  - 2006: Scale up of HIV prevention programs targeting people who inject drugs (PWID) (Giang et al., 2013)
- Sterile injection equipment, the introduction and expansion of methadone treatment, and increased access to antiretroviral therapy (Government of Vietnam, 2014)
- Although the proportion of HIV infections among PWID has declined from 30% in 2005 to 22% in 2013, PWID remain the largest risk group living with HIV infection (Vietnam Administration of HIV/AIDS Control, 2013)
- Since November 2013: Implementation of an integrated drug treatment program within an HIV treatment setting at Go Vap clinic, Ho Chi Minh City, Vietnam.
- Integrated Treatment provided
  - An opiate maintenance treatment (OMT) with methadone (MET) or buprenorphine/naloxone (BUP/NX)
  - Introduction of BUP/NX (Suboxone®) in January 2015
  - First time in Vietnam
  - Counseling: 12 weekly sessions and 10 monthly sessions thereafter
  - HIV screening and HIV treatment if needed
  - HCV screening

## Objectives

- To report on basic measures of efficacy and cost for the first 6 months of this integrated treatment program
- Dosing schedule: All participants were required to receive their medications in directly observed dosing as Vietnamese law does not allow take-home medication.
  - Methadone
    - Daily dosing at the clinic
  - Buprenorphine/naloxone
    - Daily dosing at the clinic at the induction of treatment
    - After four weeks of stable dose, switch to thrice weekly dosing (if clinically possible)
- Thus, we measured the efficacy and cost of three medication treatment strategies: daily methadone (MET), daily buprenorphine/naloxone (BUP/NX) and thrice weekly BUP/NX

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**Conflict of Interest:** Suboxone® tablets were donated by Reckitt-Benckiser/ Indivior PLC. The pharmaceutical company has no role in study design, data collection, nor data analyses

## Methods

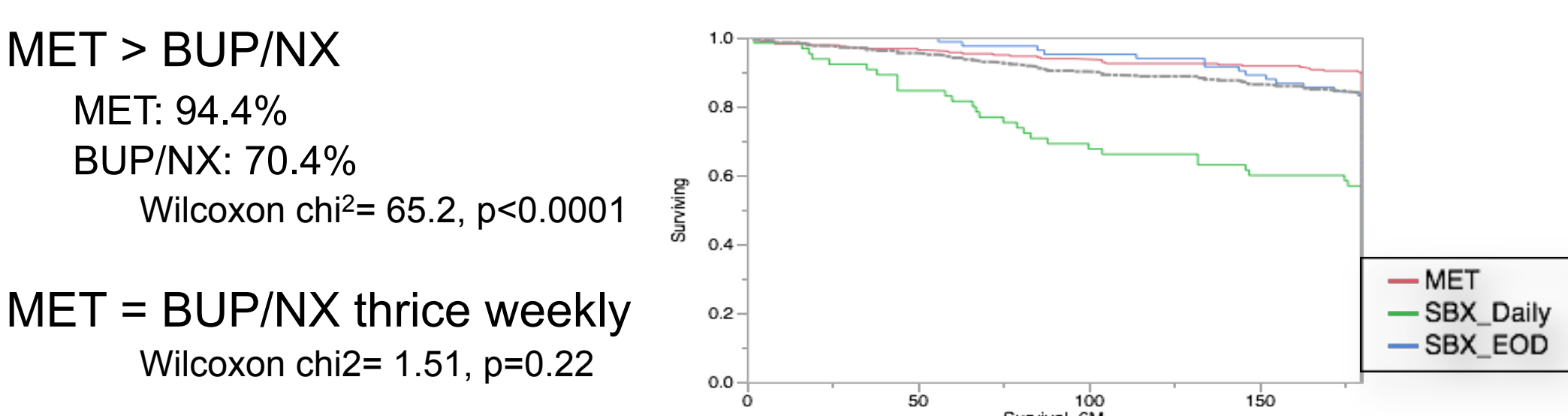
- Efficacy of treatment at 6 months was assessed by
  - Treatment retention
  - Treatment adherence pharmacy dispensing records
  - Heroin-free days
- Self-reports of drug use: collected on a weekly basis for 12 weeks and monthly thereafter
- Urine drug screens: randomly once a week for the first 12 weeks of treatment and twice a month thereafter
- Agreement between self-report use and urine drug screen: high (89%)
- Cost of treatment: Data collected with the Drug Abuse Treatment Cost Analysis Program (DATCAP) (French, 2003; McCollister et al., 2016; McCollister et al., 2009).
  - Cost of opiate integrated treatment delivery
    - Including time for physician, nurse, pharmacist, counselor, cost of biological test (blood test, EKG, urine drug screen), and cost to run the clinic (guard, cleaning, office supplies, furniture)
    - Cost for client
      - Including the cost to travel to and from the clinic and the cost for missing time at work
    - Cost of the medication
      - For the study, MET (methadone hydrochloride oral concentrate) provided by Mallinckrodt PLC, Ireland at a cost of US\$0.0047 per milligram,
      - BUP/NX (Suboxone® tablets) provided by Indivior PLC, UK at a cost of US\$0.5 per milligram
- Comparative economic evaluations and performance assessments for each treatment have been performed using Chi<sup>2</sup>, t-tests, and analyses of variance

## Results

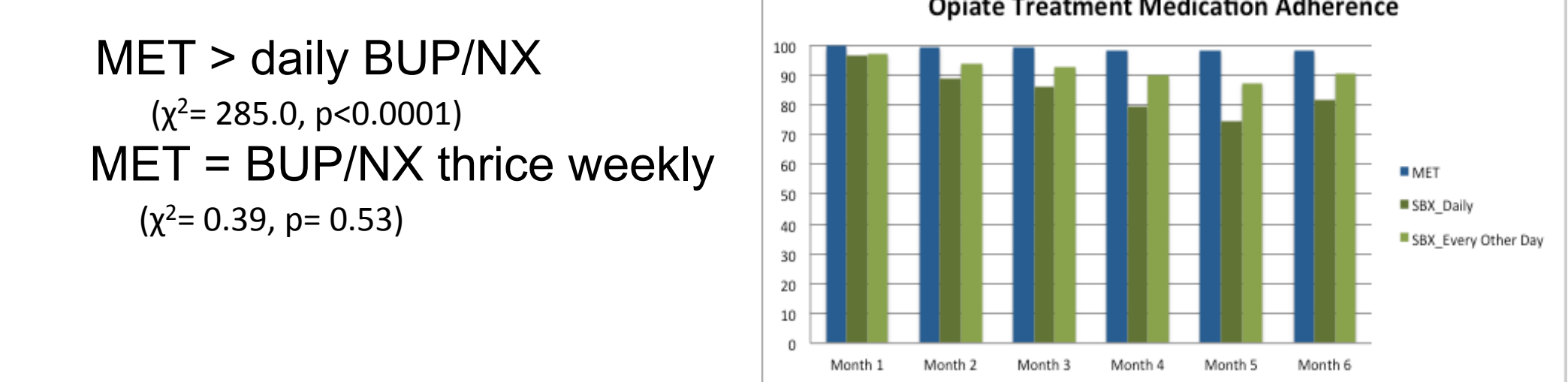
Participant characteristics at baseline

	All (n=316)	Methadone (MET) (n=228)	Buprenorphine/naloxone (BUP/NX) (Suboxone®) (n=88)		MET vs. BUP/NX Test, p-value
			Daily (n=33)	Thrice weekly (n=55)	
Age Mean (SD)	32.2 (6.1)	32.4 (6.4)	32.6 (6.8)	32.3 (7.6)	t=0.31, p=0.76
Gender - Males n (%)	306 (96.8)	221 (96.6)	85 (96.6)	31 (100.0)	$\chi^2=0.00$ , p=0.99
Education - High school or higher - n (%)	121 (38.3)	81 (35.6)	40 (45.5)	14 (45.2)	$\chi^2=2.66$ , p=0.13
Living condition With parents/ family n (%)	258 (81.6)	184 (80.8)	74 (84.1)	25 (80.6)	$\chi^2=0.46$ , p=0.53
Currently have a job - n (%)	215 (68.0)	159 (69.6)	56 (63.9)	37 (64.6)	$\chi^2=0.83$ , p=0.36
Serology - n (%)					
HIV-positive	102 (32.3)	79 (34.6)	23 (26.1)	7 (22.6)	$\chi^2=2.16$ , p=0.14
Hepatitis C-positive	224 (70.9)	158 (69.1)	66 (75.0)	22 (71.0)	$\chi^2=1.08$ , p=0.30
Opiate Use					
Age of onset - y.o. Mean (SD)	19.5 (4.1)	19.5 (4.2)	20.9 (5.4)	21.9 (5.7)	t= 2.19, p=0.03
Years of use Mean (SD)	7.9 (6.9)	8.0 (7.0)	7.5 (5.6)	6.8 (3.7)	t=0.64, p=0.52
Days of use past 30 days Mean (SD)	29.8 (1.2)	29.8 (1.1)	29.8 (1.1)	29.7 (1.8)	t= 0.04, p=0.97
No. previous drug treatment Mean (SD)	5.6 (4.8)	5.9 (5.1)	4.7 (3.6)	3.9 (3.2)	t= 2.49, p=0.01
Other substance use - n (%) past 30 days					
Alcohol	61 (19.3)	44 (19.3)	17 (19.5)	8 (25.8)	$\chi^2=0.28$ , p=0.62
Amphet/ Methamphetamine	25 (7.9)	16 (6.5)	9 (12.3)	5 (15.5)	$\chi^2=2.85$ , p=0.09
Benzodiazepines	17 (5.4)	13 (5.3)	4 (5.6)	1 (3.0)	$\chi^2=0.01$ , p=0.92
Tobacco	312 (98.7)	225 (98.9)	87 (98.9)	31 (100.0)	$\chi^2=0.00$ , p=0.99

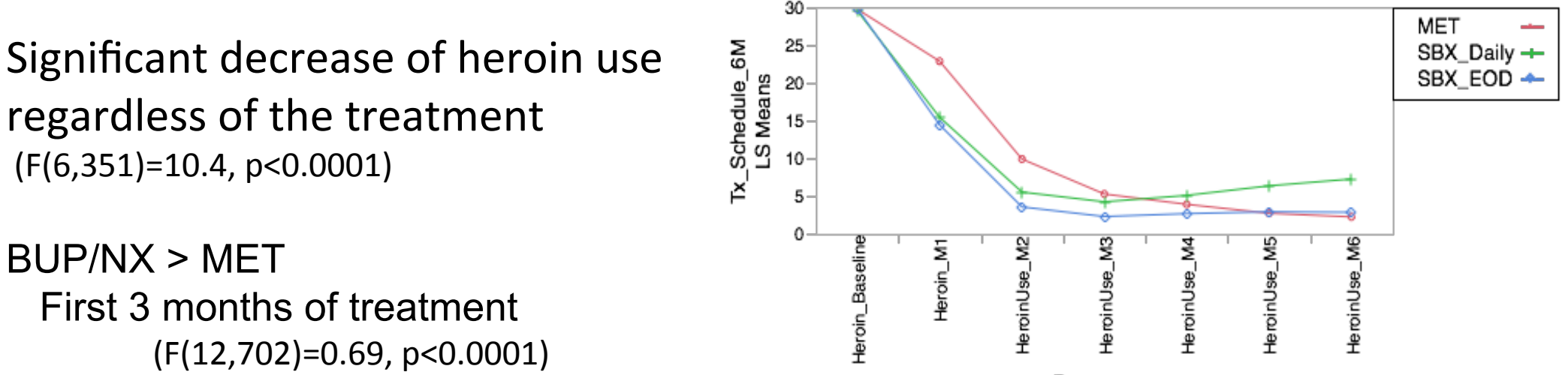
- High retention in treatment at 6 months (85.1%)



- High OMT adherence rate (94.2%)



- Heroin use



- No change in other substance use

## Results (cont')

- Cost of 6 months of the integrated treatment program per participant in US\$ for all participants (i.e. regardless of their HIV-status), and according to his/her HIV-serostatus (HIV-positive, HIV-negative)
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- | Category        | MET    | SBX_Daily | SBX_EOD | MET    | SBX_Daily | SBX_EOD | MET    | SBX_Daily | SBX_EOD |
|-----------------|--------|-----------|---------|--------|-----------|---------|--------|-----------|---------|
| Cost for client | 154.01 | 236.63    | 123.29  | 144.93 | 285.77    | 134.34  | 157.45 | 212.06    | 116.12  |
| Cost of care    | 948.22 | 948.22    | 405.86  | 948.22 | 948.22    | 405.86  | 948.22 | 948.22    | 405.86  |
| Medication      | 101.84 | 1680.47   | 1351.21 | 140.48 | 1729.00   | 1372.00 | 87.24  | 1656.20   | 1337.70 |
- Total cost of 6 months of the program
    - Daily MET US\$1204.08 (SD=160.21) < daily BUP/NX US\$2865.31 (SD=480.36)
    - Daily MET < BUP/NX thrice weekly US\$1880.37 (SD=168.56)
    - ( $F(2,122)=374.21$ ,  $p<0.0001$ )
  - HIV-positive serostatus slightly increased but not significantly the total cost per participant ( $t=1.08$ ,  $p=0.28$ )
    - Regardless of medication and dosing schedule
  - Cost of medication: BUP/NX > MET ( $F(2,122)= 455.61$ ,  $p<0.0001$ )
  - Cost of care (treatment delivery, counseling, staff support)
    - MET daily = BUP/NX daily
    - BUP/NX thrice weekly: decreased of cost of care by almost 60% (US\$948.22 vs. US\$405.86) ( $t=2432.11$ ,  $p<0.0001$ )
  - Cost for clients:
    - Daily BUP/NX > daily MET and thrice weekly BUP/NX ( $F(2,122)=5.13$ ,  $p=0.0073$ )
    - Difference was driven by the weekly time spending at the clinic

## Conclusion

- The three approaches to treatment appear to be as efficient to treat opiate use disorder
  - As part of a comprehensive and integrated treatment program i.e. OMT and structured counseling sessions
  - BUP/NX quit heroin earlier (within the first 3 months of Tx)
- Total cost of 6 months of integrated treatment with MET was lower than with BUP/NX
  - Consistent with the cost of OMT reported in different countries
  - Range of cost: US\$2,154 - US\$6,166 for MET and US\$2,278 - US\$3,151 for BUP/NX (Geitona et al., 2012; Gouveia et al., 2015; Khemiri et al., 2014; King et al., 2016; Martinez-Raga et al., 2010; Ruger et al., 2012; Schackman et al., 2012)
  - Cheapest range price for office-based (vs. clinic-based)
- Integration of opiate maintenance treatment and HIV care in the same setting
  - Not significantly increase the cost of the addiction treatment
  - Decrease cost for HIV-positive participants by preventing them from having to travel to different locations
- In a context where no take-home dose is allowed, BUP/NX thrice weekly
  - Reduces staff time and infrastructure needs as well as cost
  - Enhance retention and adherence in treatment
  - More effective in reducing heroin

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