

# Initial Findings: Methamphetamine Use & Heart Failure Among Native Hawaiians: The Malama Pu'uwai Study

MK Mau, K Asao, J Efird, E Saito, RE Ratner, M  
Hafi, T Seto

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J. Keawe'aimoku Kaholokula (Co-I)

Jimmy Efirid

Karynna Asao (Summer Intern)

Nobumi Nakamura (Study Coordinator)

Christine Ibanez

Sharlyn Sylva

Gloria Bennett

JoAnn Kimura

L. Ka'ohimanu Dang

Kapiolani Nee

Robert Ratner (MRI)

Muhannad Hafi (MRI)

Todd Seto (Co-PI)

Gerard Akaka (Co-I)

May Vawer (Study Coordinator)

Beth Blackburn

Malia Young

Ruth Aguda-Valenzuela

Ann Cook

Kauka Adjudicators

Dr. Kalani Brady

Dr. Tom Au

Dr. Aaron McMurtray

# Methamphetamine Use & Heart Failure in Native Hawaiians & Pacific Island Peoples

- Background
- Methods
- Results
- Conclusions
- Discussion

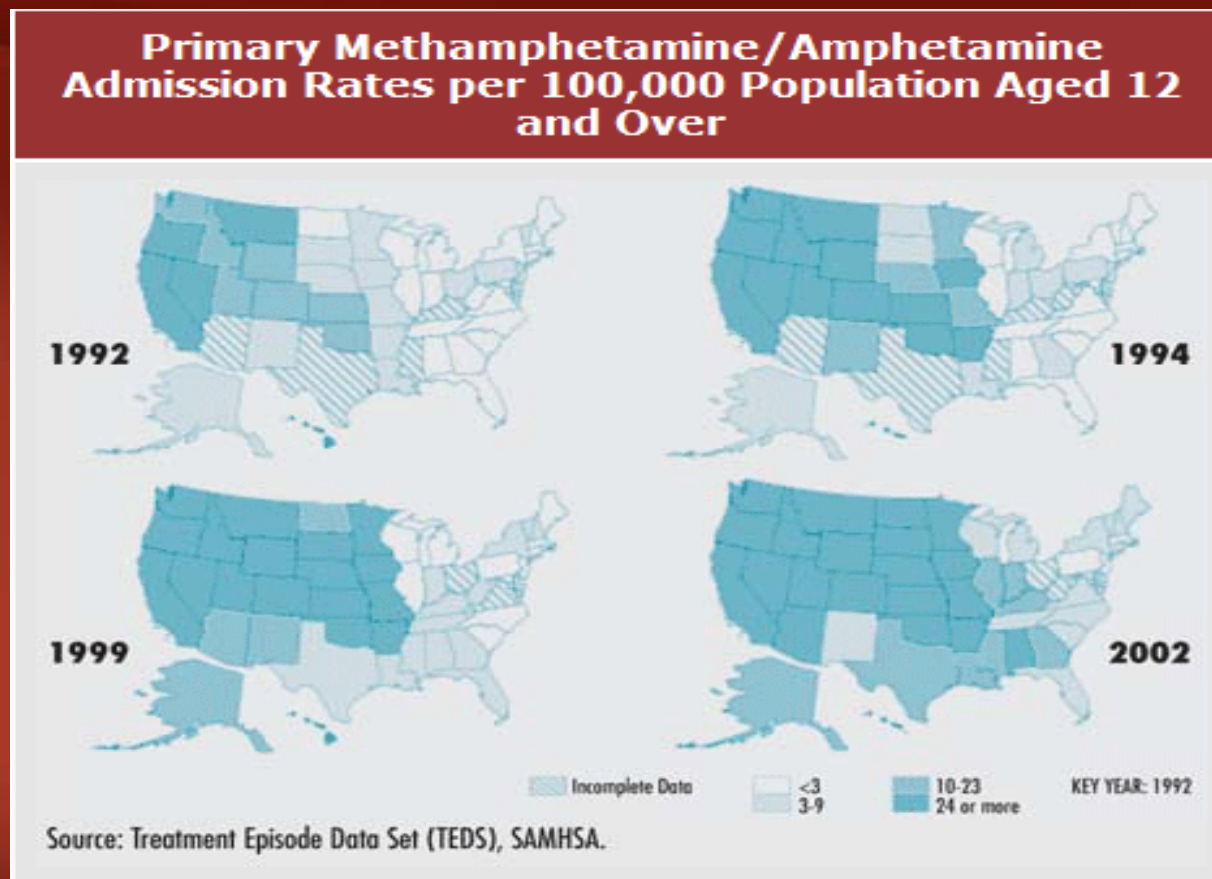


**Malama Pu'uwai Study**  
A Research Partnership: DNHH & QMC

# Methamphetamine in the USA

In the West:  
persistent  
problem - HIGH  
areas in:

- Honolulu
- **San Diego**
- Seattle
- **San Francisco**
- **Los Angeles**



# What is Methamphetamine?

## Methamphetamine vs. Cocaine

<b>Stimulant</b>	—	<b>Stimulant and local anesthetic</b>
<b>Man-made</b>	—	<b>Plant-derived</b>
<b>Smoking produces a long-lasting high</b>	—	<b>Smoking produces a brief high</b>
<b>50% of the drug is removed from the body in 12 hours</b>	—	<b>50% of the drug is removed from the body in 1 hour</b>
<b>Increases dopamine release and blocks dopamine re-uptake</b>	—	<b>Blocks dopamine re-uptake</b>
<b>Limited medical use</b>	—	<b>Limited use as a local anesthetic in some surgical procedures</b>

Methamphetamine, unlike Cocaine, longer duration & larger percentage unchanged in body

# Health effects of Methamphetamine



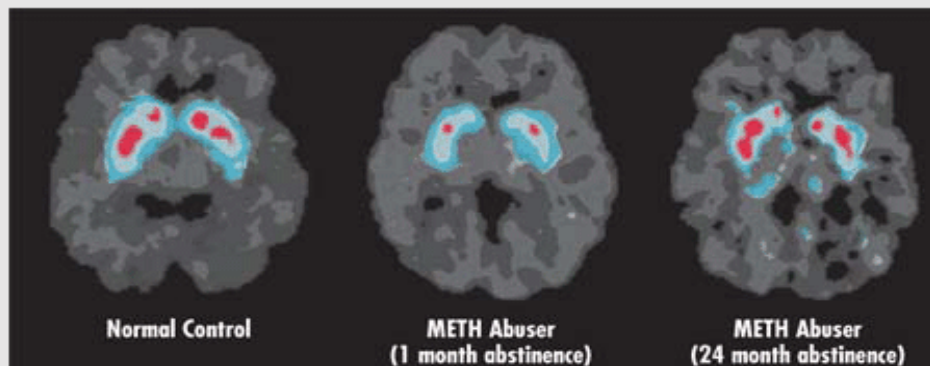
## Short-term effects may include:

- Increased attention and decreased fatigue
- Increased activity and wakefulness
- Decreased appetite
- Euphoria and rush
- Increased respiration
- Rapid/irregular heartbeat
- Hyperthermia

## Long-term effects may include:

- Addiction
- Psychosis, including:
  - paranoia
  - hallucinations
  - repetitive motor activity
- Changes in brain structure and function
- Memory Loss
- Aggressive or violent behavior
- Mood disturbances
- Severe dental problems
- Weight loss

## Recovery of Brain Dopamine Transporters in Chronic Methamphetamine (METH) Abusers



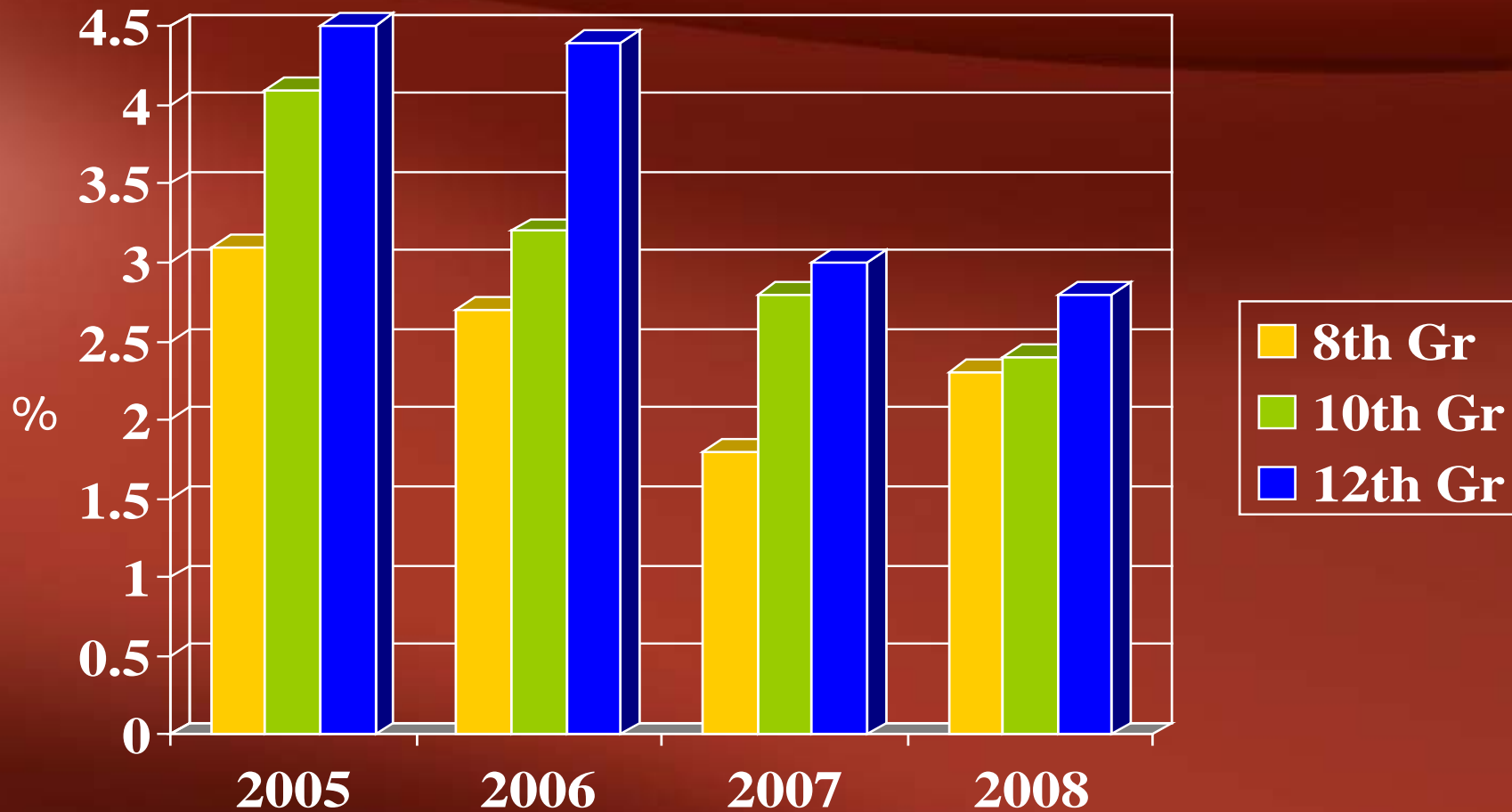
Source: Volkow ND et al., *Journal of Neuroscience* 21:9414–9418, 2001.



# Illicit Drug Use Trends in Youth (2005-2008)



# Methamphetamine Use Trends in Youth (2005-2008)





# Methamphetamine Use & Heart Disease

- Less known effects of MU on CV System
- Minorities at high risk – Western region
  - NHs, Pacific Island Peoples, etc.
- CVD assoc. with Chronic MU
  - Cardiomyopathy & Heart failure
- Heart failure – leading cause of CVD hospitalizations
  - 5.2 million prevalence, \$33.2 billion

# Risk factors associated with methamphetamine use and heart failure among Native Hawaiians and other Pacific Island peoples

Marjorie K Mau<sup>1</sup>  
Karynna Asao<sup>2</sup>  
Jimmy Efird<sup>3</sup>  
Erin Saito<sup>4</sup>  
Robert Ratner<sup>5</sup>  
Muhannad Hafi<sup>5</sup>  
Todd Seto<sup>6</sup>

<sup>1</sup>Department of Native Hawaiian Health; <sup>2</sup>Biostatistics and Data Management Facility; <sup>3</sup>Department of Medicine, John A. Burns School of Medicine, University of Hawai'i at Manoa; <sup>4</sup>Claremont College; <sup>5</sup>Medstar Research Institute

**Objective:** Heart failure (HF), a long term outcome of chronic methamphetamine use (MU), occurs more frequently in racial and ethnic minority populations at high risk for cardiovascular disparities. This study examined the association of socio-demographic and clinical risk factors with MU among heart failure patients who are Native Hawaiians (NH) or other Pacific Island peoples (PIP).

**Design/Setting/Patient Population:** Cross-sectional study of NHs and PIPs with advanced heart failure enrolled in the Malama Pu'uwai Study, a randomized control trial to test an educational intervention to reduce re-hospitalization and/or death. A total of 82 participants were enrolled between 6/1/06 to 12/31/07 and met the following eligibility criteria: 1) self-identified NH or PIP 2) Left ventricular systolic ejection fraction  $\leq$ 45%, 3) Age of 21 years or older. Data were analyzed by odds ratios (OR), 95% confidence intervals (CI), and multiple logistic regression analysis.

**Main Outcome Measure:** Methamphetamine use.

**Results:** Twenty-two percent of HF participants were identified as being current or prior methamphetamine users. Younger age and non-married status (combined never married or divorced/separated) were independently associated with MU after adjustment for sex, education, and other co-morbidities associated with HF (ie, age  $>$ 50 years, OR = 0.16, 95% CI, 0.03–0.84; non-married status combined as never married OR = 8.5, CI, 1.5–47; divorced/separated OR = 11, CI 1.8–75).

**Conclusions:** Risk factors associated with MU in NH and PIPs with heart failure include: younger age and being divorced/separated or never married. Health care providers should be aware of MU as a contributing factor in the approach and treatment of HF in NHs and PIPs.

# Malama Pu'uwai Study (MPS)

## Methods

- Randomized Control Trial
  - Testing HF education to prevent re-hosp/death
- Eligibility
  - Native Hawaiian or Other Pacific Island People
  - Advanced heart failure ( $\leq 45\%$  Sys Eject Fraction)
  - age  $\geq 21$  yr. old
  - recently discharged from hospital
- **For this study:** Baseline exam
- N = 82 ppts; Jun 2006 – Dec 2007

## Results – Table 1: Demographic Characteristics

Variable	+ Meth Use N = 18	- Meth Use N = 64	OR (95% CI)
Age (yrs)	mean = 43 yr	mean = 58 yr	
<40	6 (33%)	6 (9%)	1.0 referent
40-49	6 (33%)	10 (16%)	0.60 (.13-2.7)
> 50	6 (33%)	48 (75%)	<b>0.13 (.03-.51)</b>
Sex			
Women	4 (22%)	22 (34%)	1.0 referent
Men	14 (78%)	42 (66%)	1.8 (.54-6.2)
Marital Status			
Currently married	2 (11%)	37 (58%)	1.0 referent
Never	10 (56%)	14 (22%)	<b>13 (2.6-68)</b>
Divorced/Separated	5 (28%)	9 (14%)	<b>10 (1.7-62)</b>
Widow/Widower	1 (6%)	4 (6%)	4.6 (.34-63)

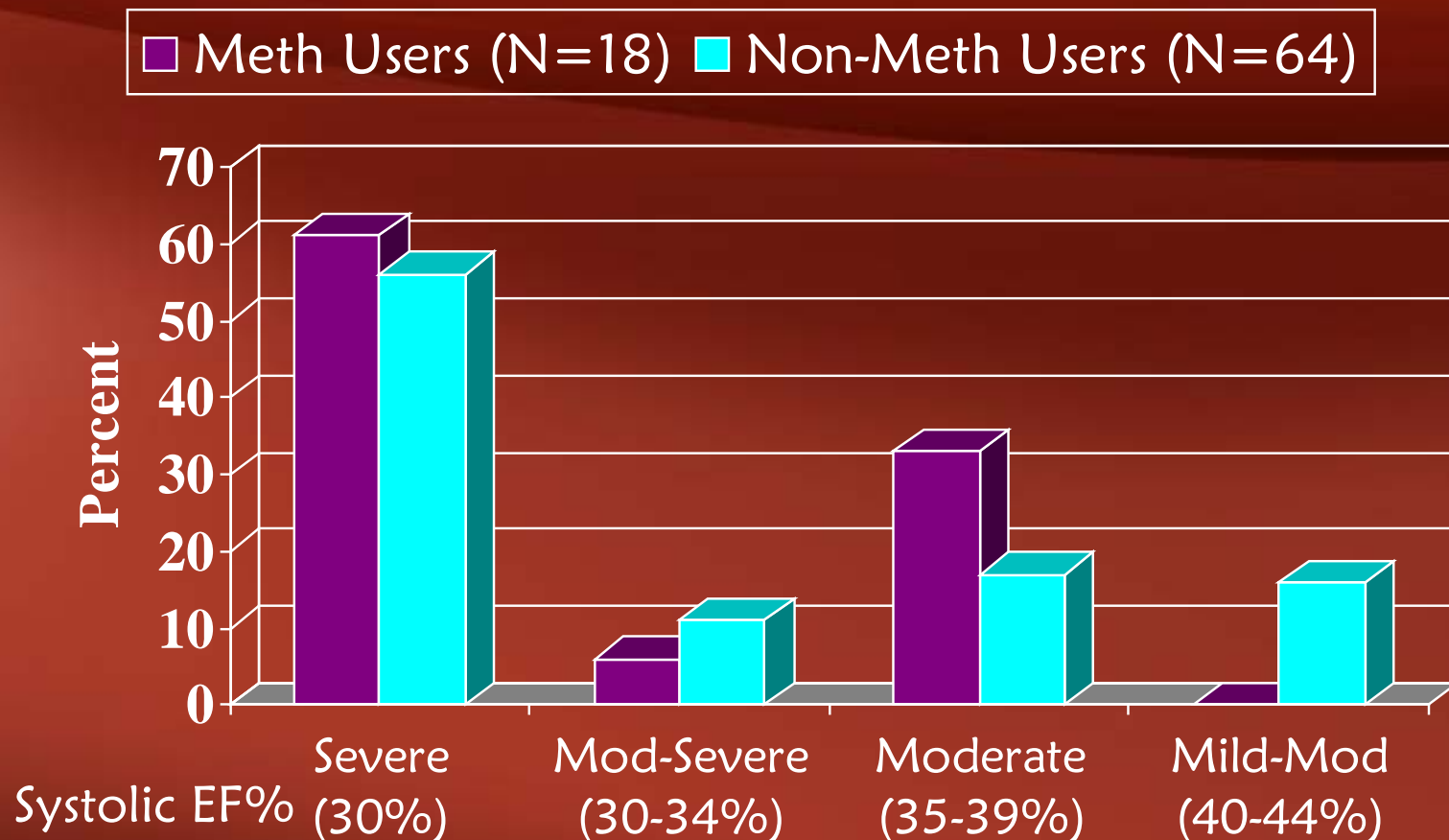
## Results – Table 1: Demographic Characteristics

Variable	+ Meth Use N = 18	- Meth Use N = 64	OR (95% CI)
<b>Education</b>			
Less than High Sch	4 (22%)	10 (16%)	1.0 referent
High School/GED	9 (50%)	32 (51%)	.77 (.20-3.0)
Some College	2 (11%)	18 (29%)	.31 (.05-2.0)
College degree	3 (17%)	3 (5%)	2.8 (.39-20)
<b>Race/Ethnicity</b>			
Native Hawaiian	16 (89%)	40 (63%)	1.0 referent
Pacific Island People	2 (11%)	24 (37%)	.21 (.04-.99)
Smoke (100 cig/life)	16 (89%)	47 (73%)	2.9 (.60-14)
Alcohol (+ 12 mon)	13 (72%)	35 (55%)	2.2 (.68-6.8)

## Results – Table 2: Clinical Characteristics

Variable	+ Meth Use N = 18	- Meth Use N = 64	OR (95% CI)
<b>Systolic BP (mmHg)</b>			
<140	6 (33%)	6 (9%)	1.0 referent
≥140	6 (33%)	10 (16%)	1.9 (.32-11)
<b>Diastolic BP (mmHg)</b>			
<90	16 (89%)	59 (92%)	1.0 referent
≥90	2 (11%)	5 (8%)	1.5 (.26-8.3)
<b>BMI (kg/m<sup>2</sup>)</b>			
<30	2 (11%)	22 (34%)	1.0 referent
30-39	8 (44%)	18 (28%)	4.9 (.92-26)
>39	6 (33%)	17 (27%)	3.9 (.70-22)
Unknown	2 (11%)	7 (11%)	3.1 (.37-27)

# Results – Table 2: Clinical Characteristics Heart Failure Status\*

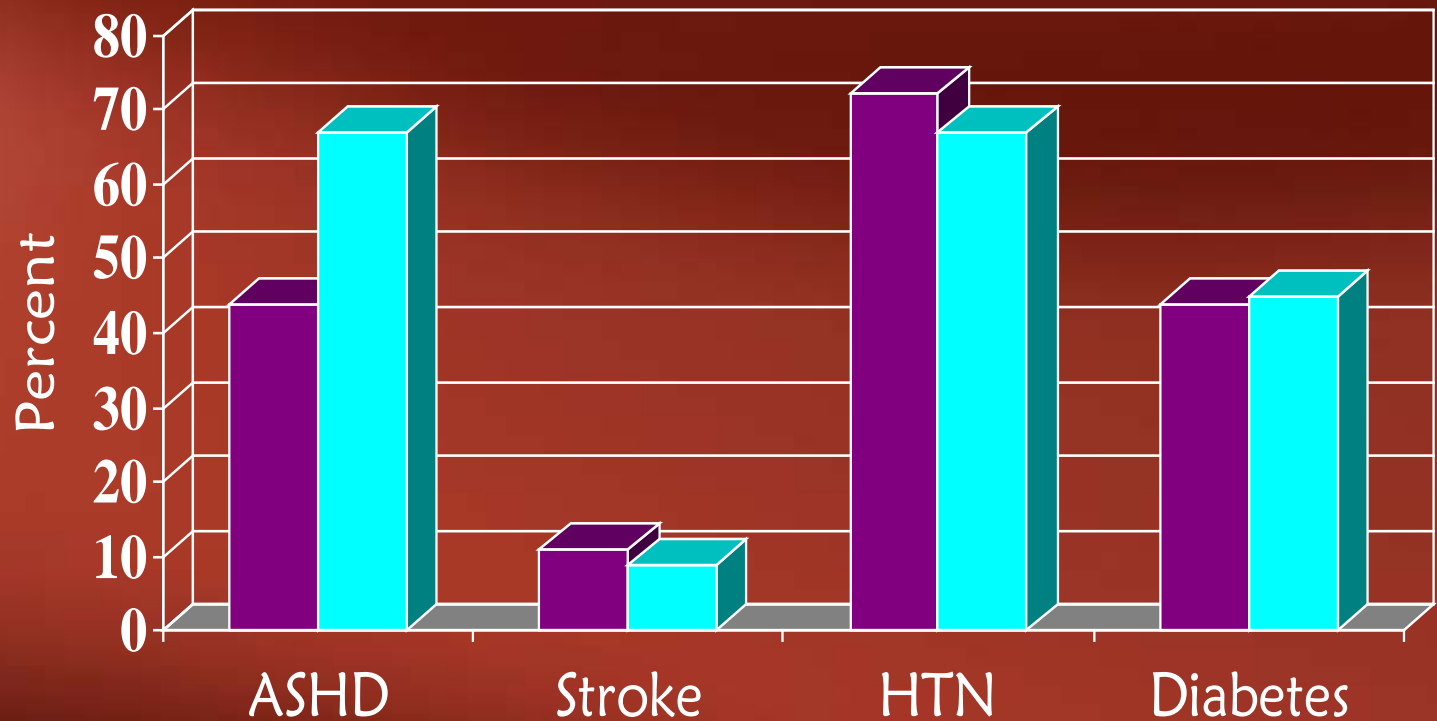


\* No significant differences between MU vs. Non-MU



# Results: Clinical Characteristics - Co-Morbid Conditions\*

■ Meth User (N=18) ■ Non-Meth User (N=64)



\* No significant differences between MU vs. Non-MU

## Results – Table 3: Multivariate Analysis Factors Associated with Methamphetamine Use; N=82

Factors*	OR (95% CI)
<b>Age (years)</b>	
Less than 40	1.0 referent
40 to 50	0.70 (.13-3.9)
More than 50	0.16 (.03-.84)
<b>Marital status</b>	
Currently married	1.0 referent
Never married	8.5 (1.5-47)
Divorced/Separated	11 (1.8-75)
Widow/Widower	5.7 (.38-87)

\* Adjustment for sex, race/ethnicity, education, alcohol use, ASHD, HTN, DM were not significant confounders to model.

# Study Conclusion

- Meth use – common among NH/PIPs with heart failure (22%)

Independent risk factors for Meth Use:

- Older age “protective” factor for Meth Use in NH/PIP with heart failure
- Unmarried status associated with Meth Use NH/PIP with heart failure
- Limitations – Cross-sectional, sample size

# Implications


- Chronic methamphetamine use – “hidden” cause of heart failure in 1 of 5 NHs/PIPs
- Native Hawaiian/Pacific Island People w/ HF
  - Younger (~50 y.o. vs. typical 75 y.o.)
  - Etiology – more HTN, DM than ASHD (compared Whites)
- HF Survival – 40% at 5 years (w/wo EF% preserved)
- Is MU-associated HF reversible compared to other causes of HF?

# Approaches for Reducing Heart Failure Disparities in NHOPIs

- Prevent Chronic Methamphetamine Use
  - Improve Social Support systems
  - Increase Programs to Prevent MU Early (i.e. in Youth)
  - Educational programs to raise awareness of CV effects (among other health effects)
- If HF exists – treatment approaches need to tx
  - Multiple co-morbidities (DM, HTN, etc.)
  - Recognize that MU may also pose challenges to treatment adherence.




# Malama Pu'uwai Study: Open enrollment



Mālama Pu'uwai  
Study

A Heart Failure  
Education Program  
for Native Hawaiians  
and Pacific Islanders



## Mālama Pu'uwai Study

**What's it all about?**

The Mālama Pu'uwai Study is a randomized control trial (RCT) to test the efficacy of a culturally-informed heart failure (HF) education and support program in Native Hawaiians and Pacific Islanders.

The Mālama Pu'uwai Study will be conducted by The Queen's Medical Center and the Department of Native Hawaiian Health at JABSON.

**The intervention includes:**

- ↳ 4 heart education lessons
- 1. Symptoms management
- 2. Medication management
- 3. Low sodium diet
- 4. Physical activity & emotion & stress management
- ↳ 1 year follow-up

**Who is eligible?**

- ☑ Native Hawaiians and Pacific Islanders (for example, Samoans, Tongans, and Marshallese).
- ☑ Adults 21 years of age or older.
- ☑ Clinical symptoms and signs of heart failure AND LV systolic EF of  $\leq 40\%$  OR  $\leq 60\%$  and evidence of abnormal diastolic function on echocardiogram.
- ☑ Recently discharged (within 2 weeks) from a hospital admission with heart failure (primary or secondary discharge diagnosis).


**All 4 criteria required to enroll**

**What can you do?**

Talk to your doctor to see if you are eligible and if you can benefit from the Mālama Pu'uwai Study.

If your doctor or you need more information, contact us at:

Phone: (808) 587-8577  
Email: puuwai@hawaii.edu



*I ka 'ai pono ke ola pono*  
"A healthy life can be achieved  
by eating right."

# Malama Pu'uwai Study

A Research Partnership: DNHH-JABSOM & QMC



**John A. Burns School of Medicine**  
University of Hawai'i at Manoa



**THE QUEEN'S  
MEDICAL CENTER**  
Honolulu, Hawaii