

Longitudinal trajectories of heroin use

Medicine

National Drug and Alcohol Research Centre

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Australian Treatment Outcome Study: 10 years (2001-2014)

Funders and Collaborators

- ✱ **All participants who give their time and experiences.**
- ✱ AOD treatment agencies
- ✱ ATCA Membership: James Pitts, Garth Popple
- ✱ National Health and Medical Research Council (NHMRC)
- ✱ Australian Department of Health
- ✱ National Drug and Alcohol Research Centre
- ✱ NSW Ministry of Health
- ✱ NSW Pharmacy Guild
- ✱ NSW Users and AIDS Association
- ✱ Hepatitis NSW
- ✱ Australia and NSW Needle and Syringe Programs
- ✱ Interstate collaborators: Prof. Alison Ritter, Prof. Robert Ali.

ATOS Researchers

- ✱ Sarah Ellis
- ✱ Philippa Ewer
- ✱ Sandra Fairbairn
- ✱ Dr Alys Havard
- ✱ Nicky Henderson
- ✱ Kate Hetherington
- ✱ Dr Christina Marel
- ✱ Sonja Memedovic
- ✱ Dr Louise Mewton
- ✱ A/Prof Katherine Mills
- ✱ Joanne White
- ✱ Evelyn Wilhelm
- ✱ Dr Anna Williamson

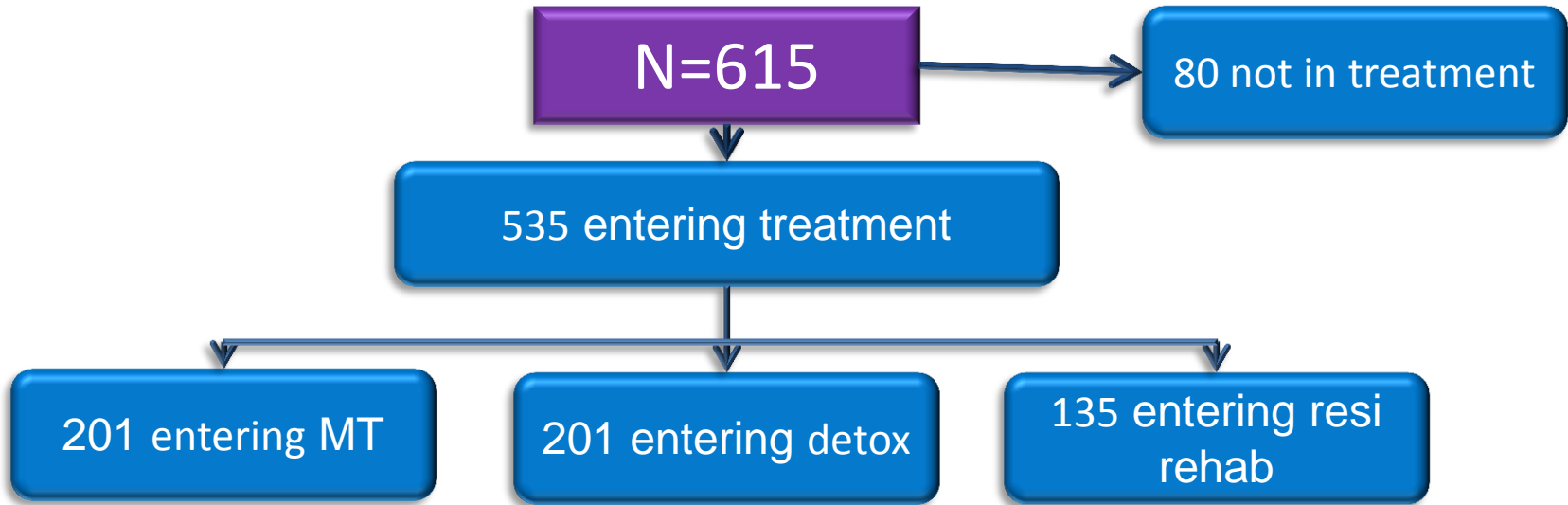
In 2001...



The Australian Treatment Outcome Study (ATOS)



- ❖ A prospective, longitudinal cohort study
- ❖ One of the few studies focusing on heroin dependence



Heroin use in Australia



❖ In 2011-12, more people sought treatment for heroin use in Australia than any other illicit drug (n=65,952) (AIHW 2012).

❖ Heroin dependence

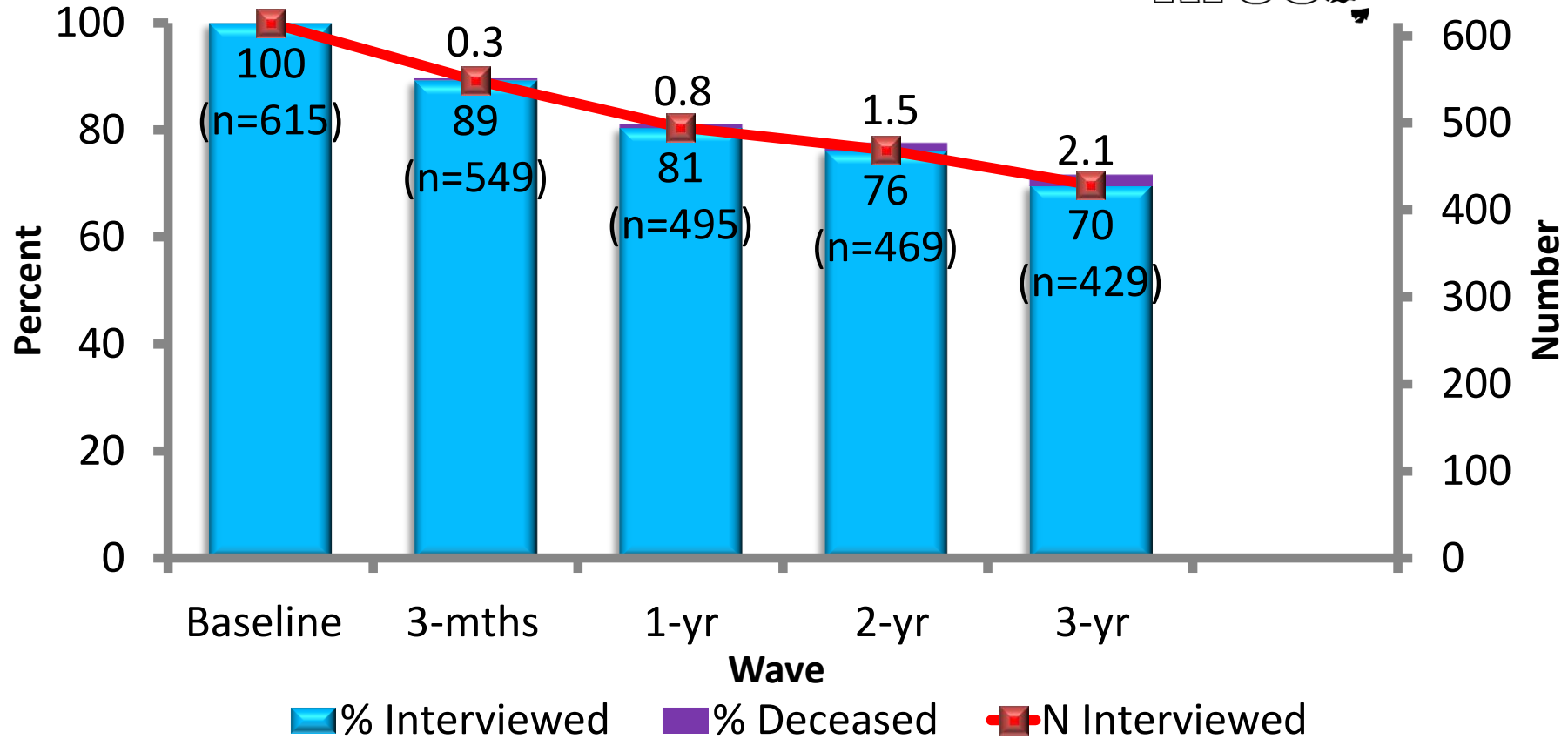
- ❖ How persistent?
- ❖ How chronic?
- ❖ Relapsing condition? When?



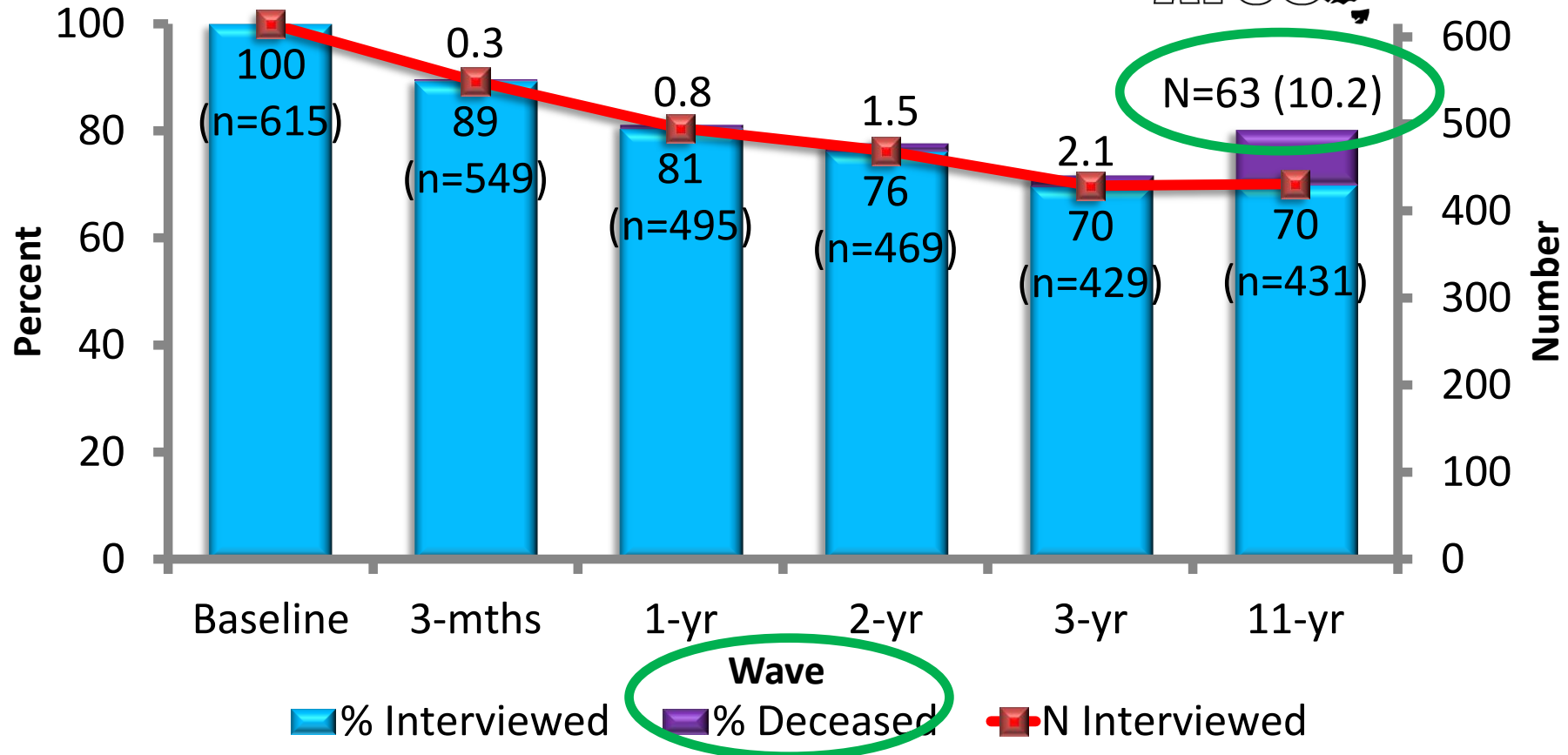
Who are the ATOS participants?

Baseline (N=615)	
% Male	66.2
Mean age	29
% Heroin dependent	97.6
Mean length of heroin use career (years)	9.6
Mean number of drug classes used	4.9
% In current treatment for opiate dependence	87.0
% Major depression	24.6
% Current PTSD	29.4

ATOS follow-up



ATOS follow-up



ATOS researchers in 2001...



ATOS researchers in 2013...



Chris Marel

Jo White & Sonja Memedovic &
Philipa Ewer

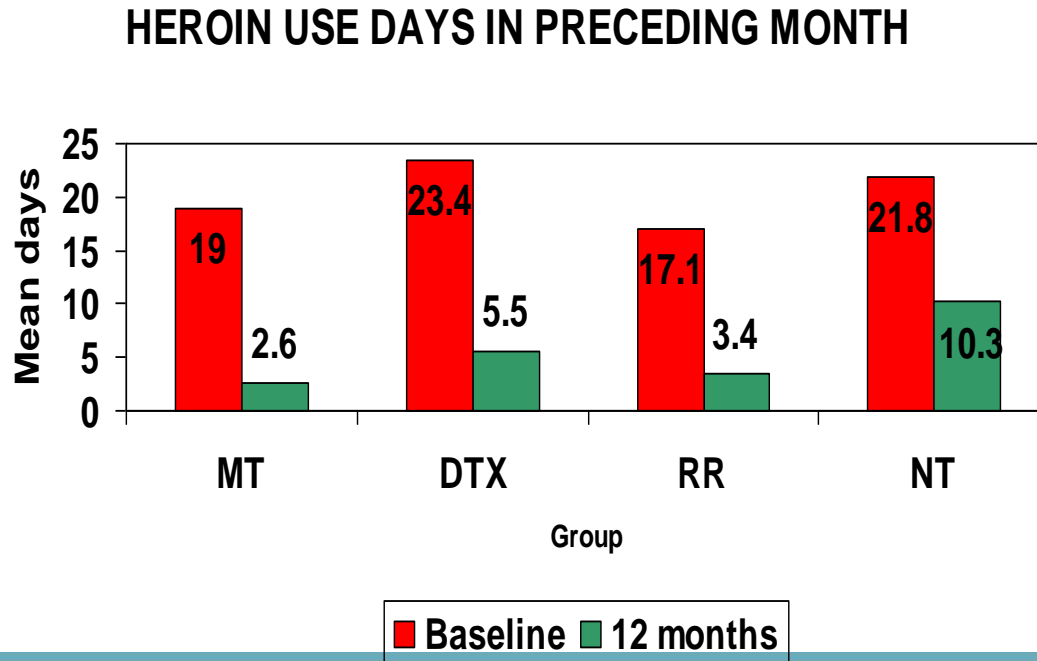
Where have we found them?



What did we find at 1 year?



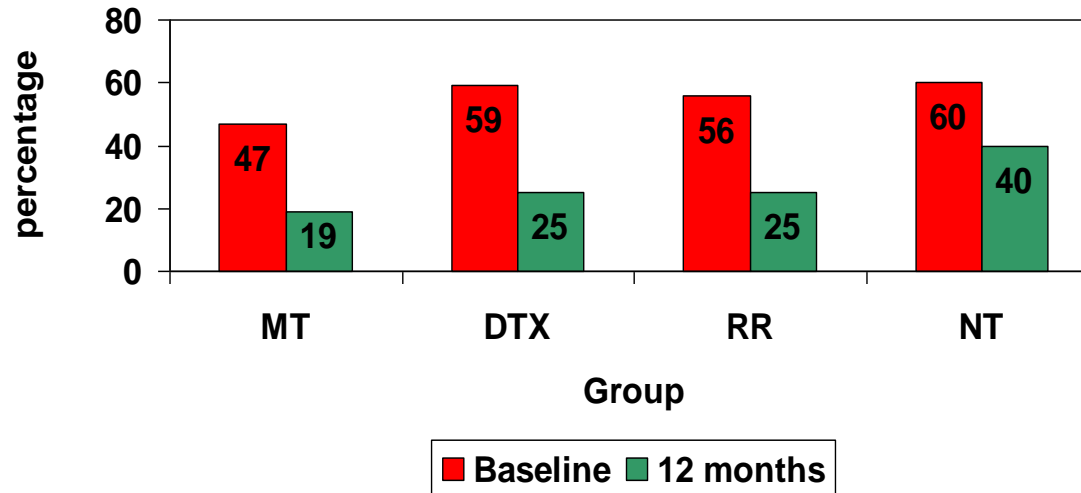
Did heroin use change in the first year?



- Predictors of less frequent heroin use
 - Less frequent use at baseline
 - More treatment days

Did criminal involvement change in the first year?

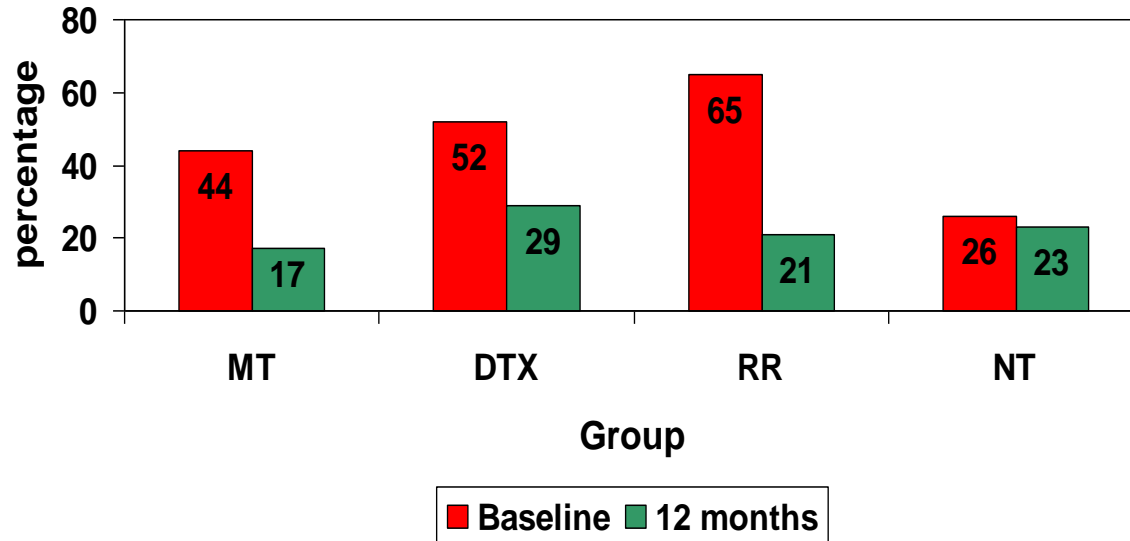
ANY CRIME IN PAST MONTH (OTI)



- Predictors of no criminal involvement
- Not being criminally active at baseline
- More treatment days
- Fewer treatment episodes

Did mental health improve in the first year?

Severe psychological distress: SF-12



- Predictors of better mental health
 - Younger age
 - Better baseline mental health
 - More treatment days
 - Fewer treatment episodes

What did it cost?

- Treatment at 12 months cost \$6,187
 - Resulting in
 - 15.3 more heroin free days per month at twelve months, a 76% improvement.
 - 55% improvement in rates of abstinence and
 - 52% decrease in the numbers who committed a crime in the previous month.

Trajectories of heroin use



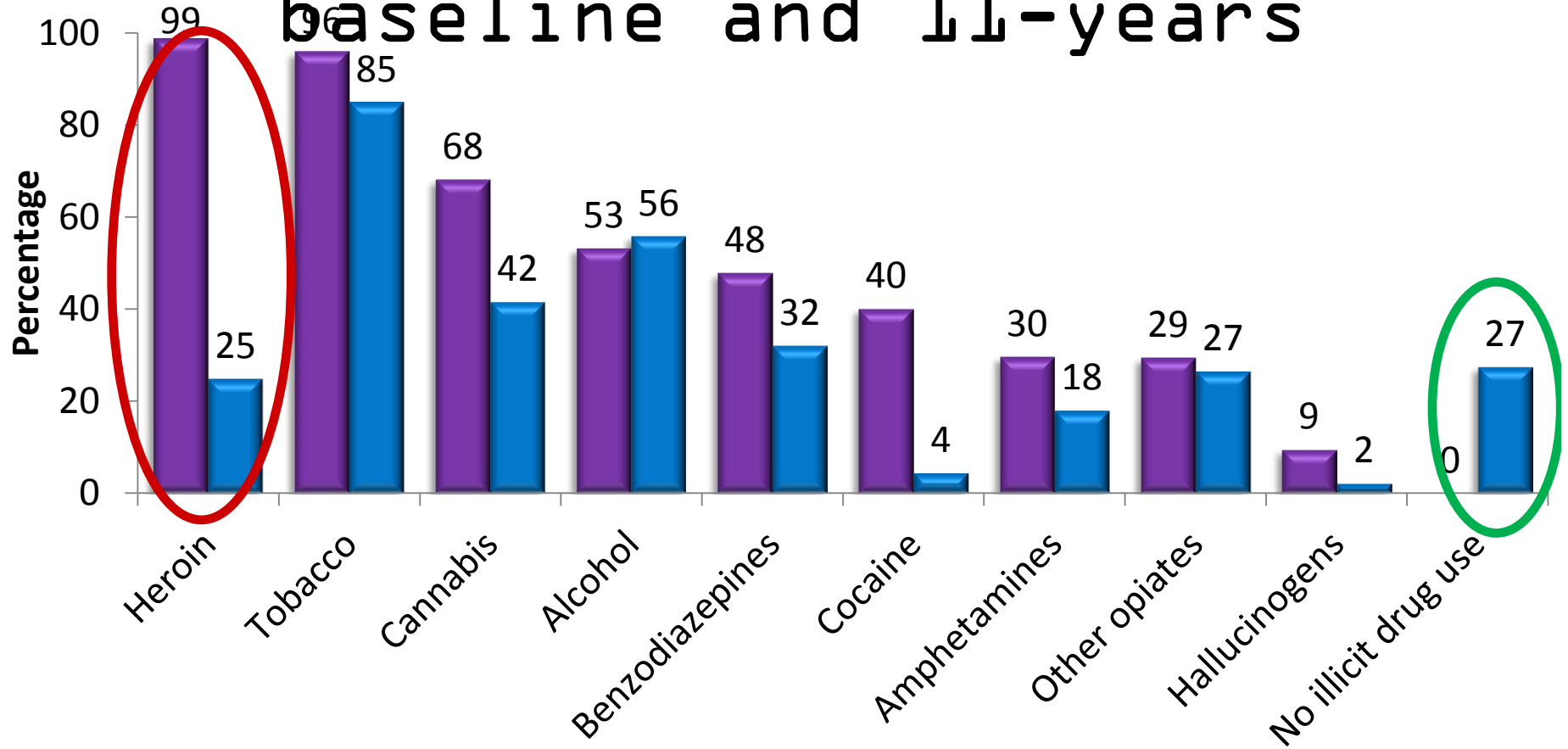
- ❖ We don't know what happens over the long-term for people with heroin dependence
- ❖ Are there indicators that can tell us what is likely to happen over the long-term for their heroin use?



ATOS participants at baseline and 11 years

	Baseline (N=615)	11-years (N=431)
% Male	66.2	64.5
Mean age	29	40
% Crime main source of income	23.9	2.1
% Used heroin in past month	98.7	24.8
% Heroin dependent	97.6	15.1
Mean number of drug classes used	4.9	3.2
% In current treatment for opiate dependence	87.0	46.6
% Major depression	24.6	20.9

Past-month drug use at baseline and 11-years





■ Baseline

■ 11-years

Trajectories of heroin use



Two stage process:

-  Modelled trajectories of heroin use, and calculated the probability of belonging to a specific group
-  Entering variables into the model to predict those pathways

*Finite mixture modelling: specifically group based mixture modelling approach (Jones, et al 2001; Nagin 2005)

Trajectory results

- ❖ We found 6 pathways of heroin use over 11-years

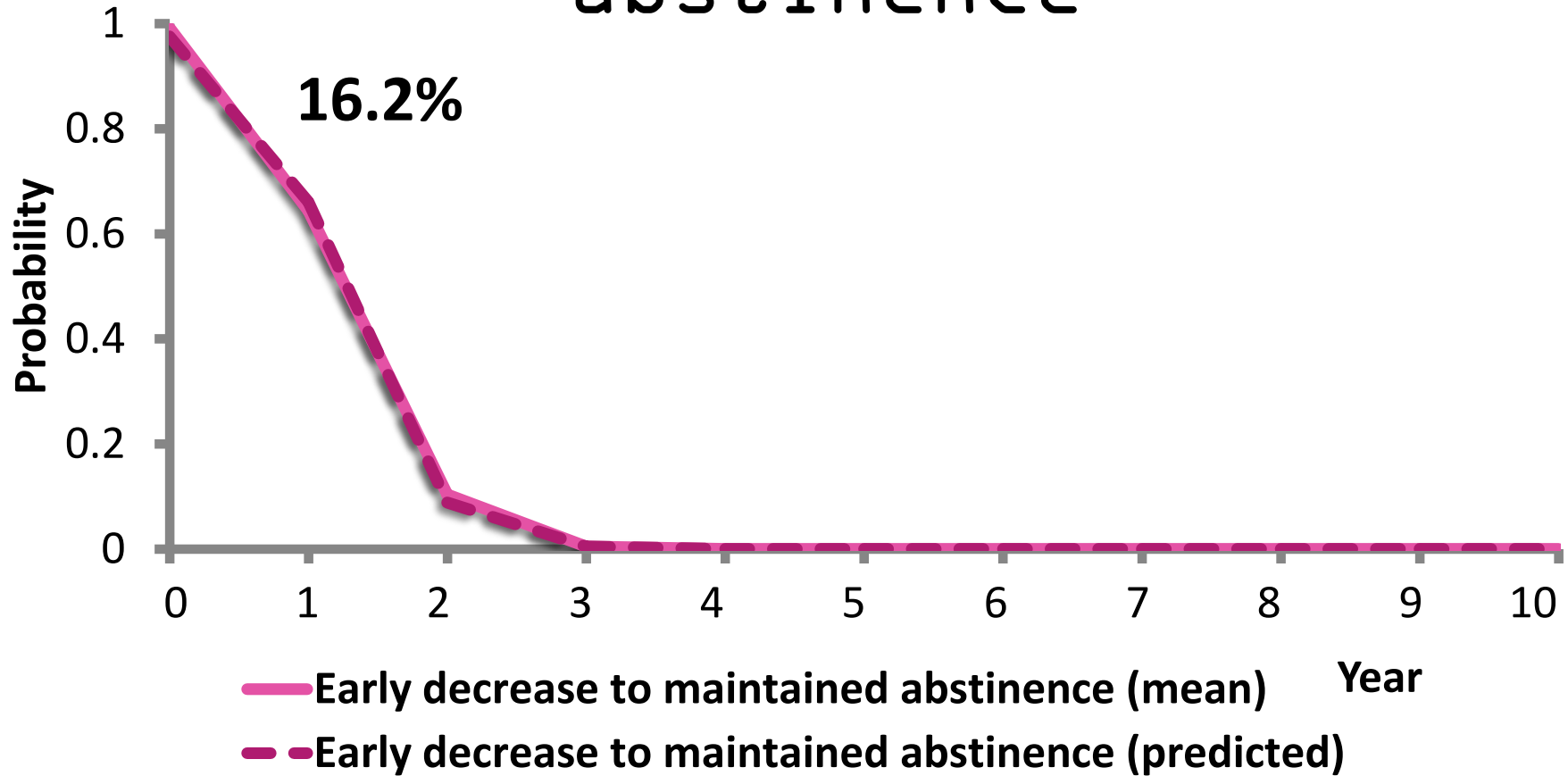


Heroin use trajectories

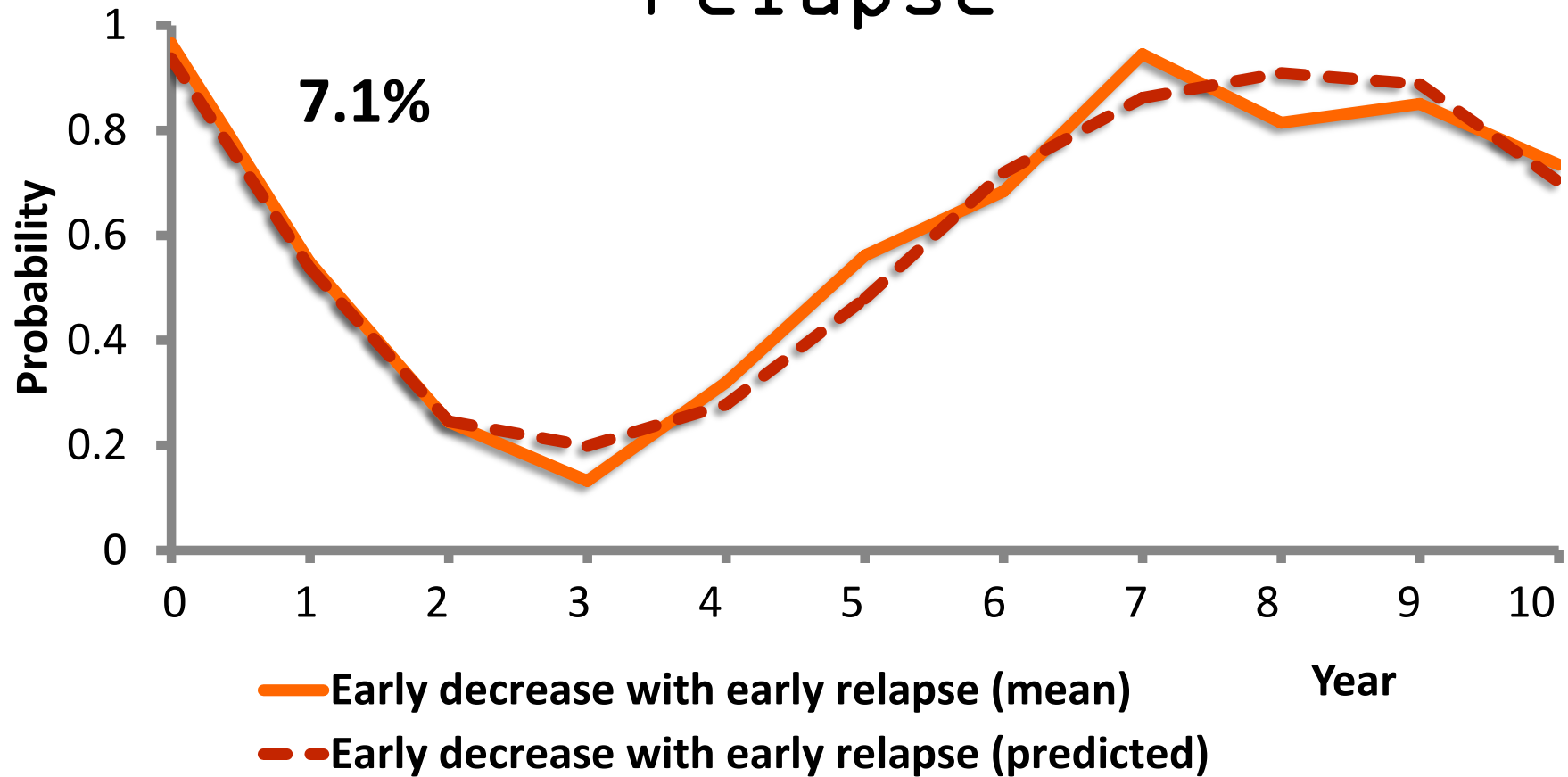


Trajectory	%
1. Early decrease to maintained abstinence	16.2
2. Early decrease with early relapse	7.1
3. Early decrease with late relapse	14.4
4. Gradual decrease to near abstinence	19.1
5. Gradual decrease	21.5
6. No decrease	21.7

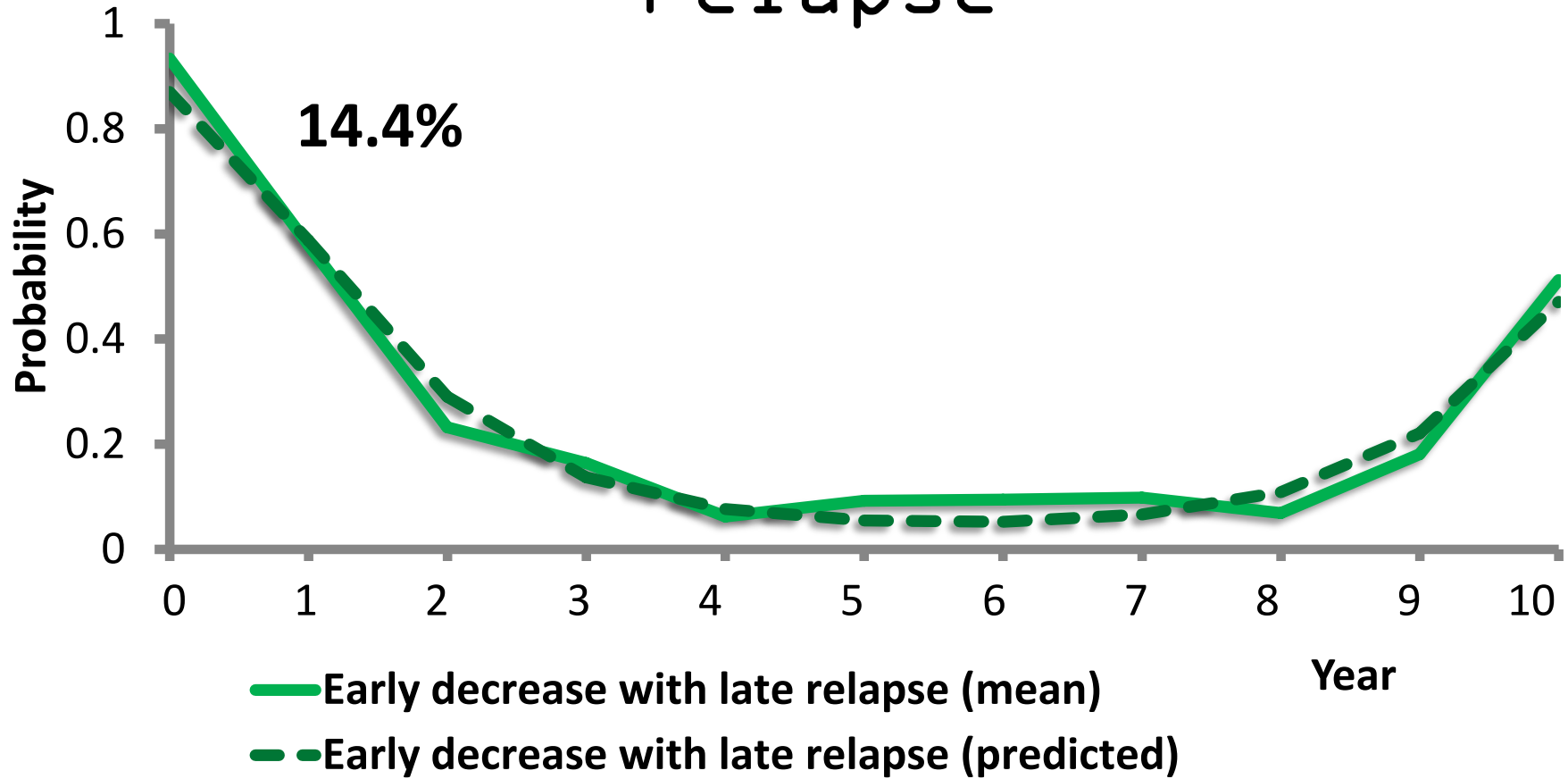
Early decrease to maintained abstinence



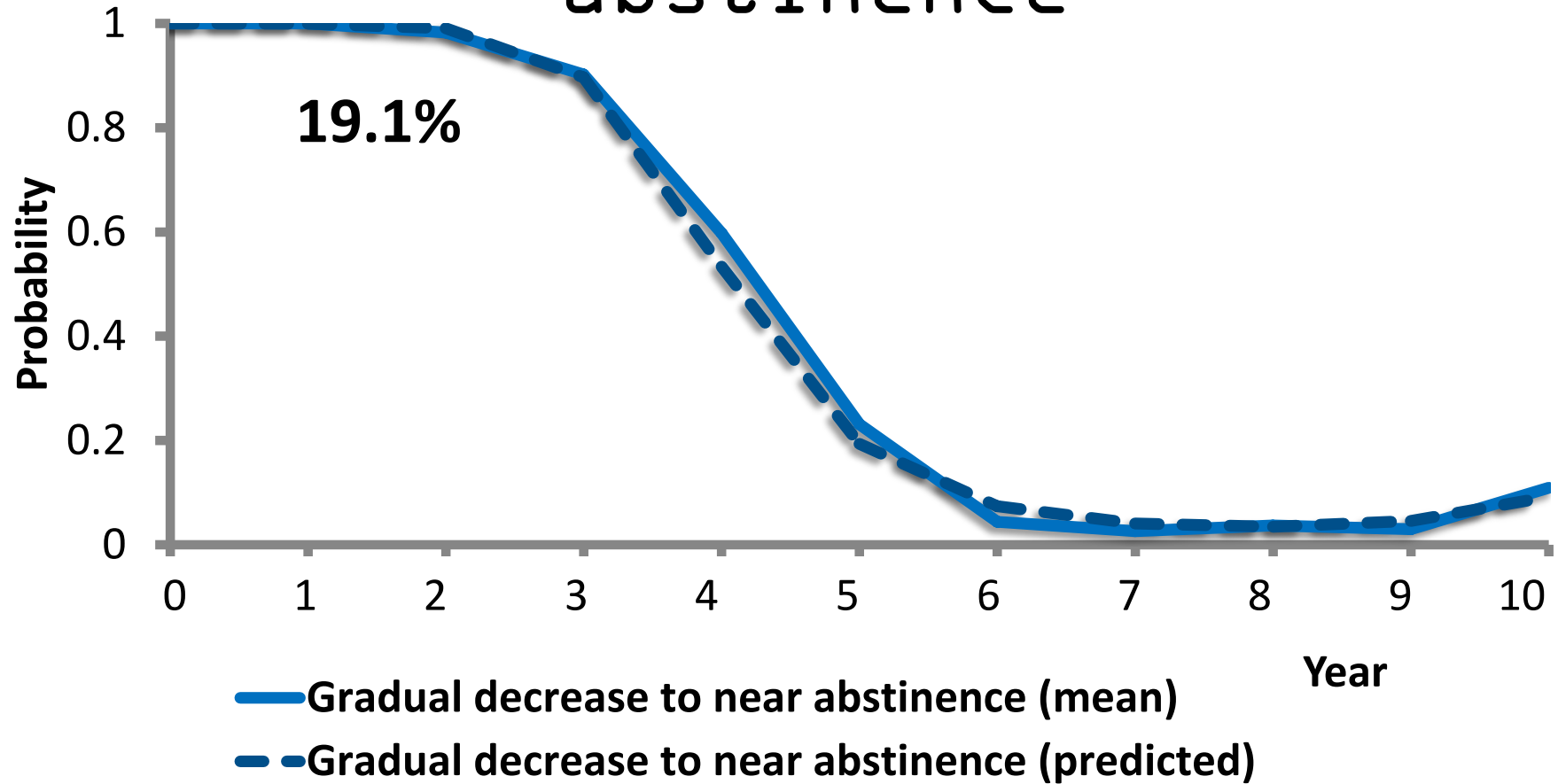
Early decrease with early relapse



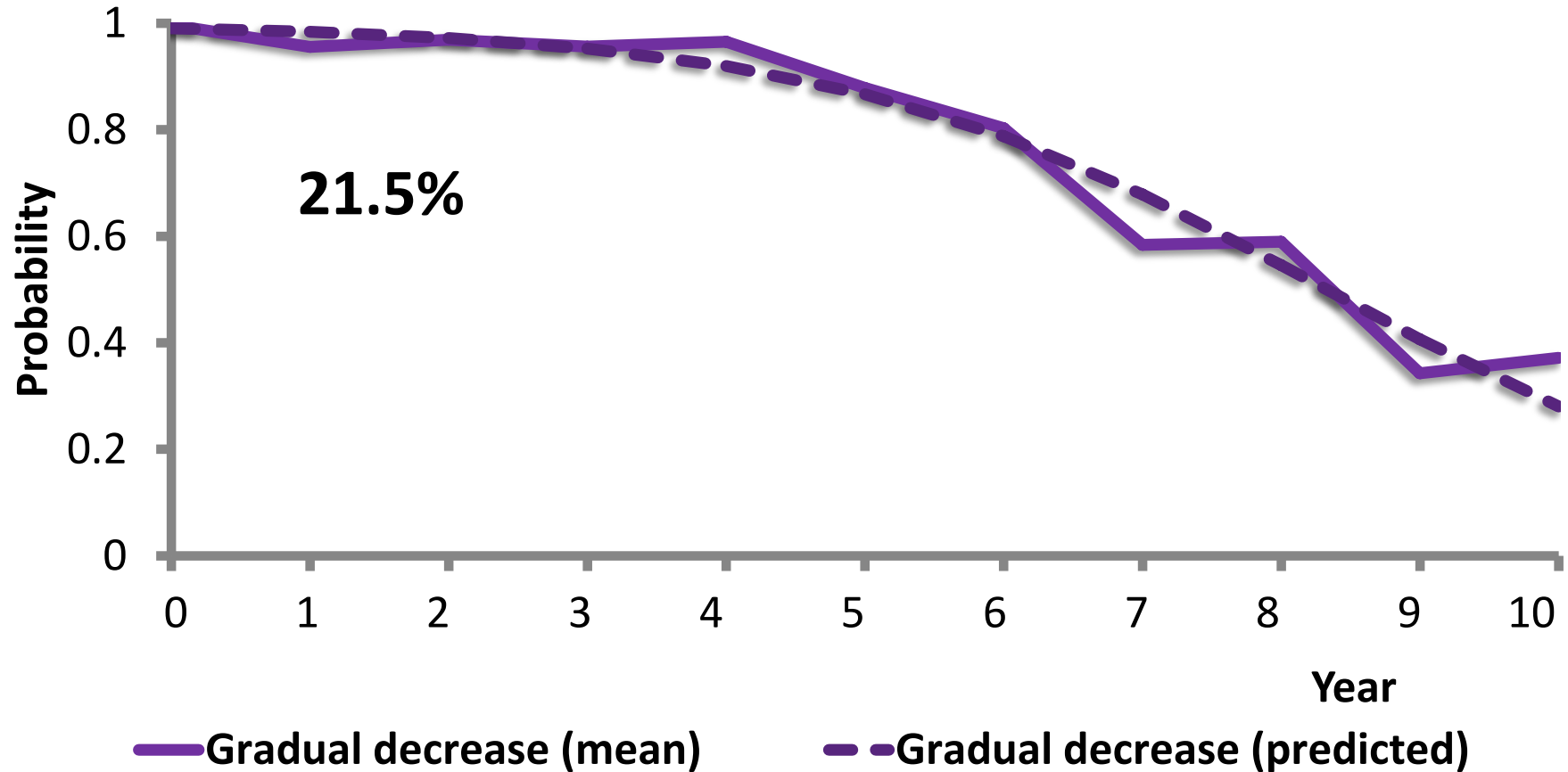
Early decrease with late relapse



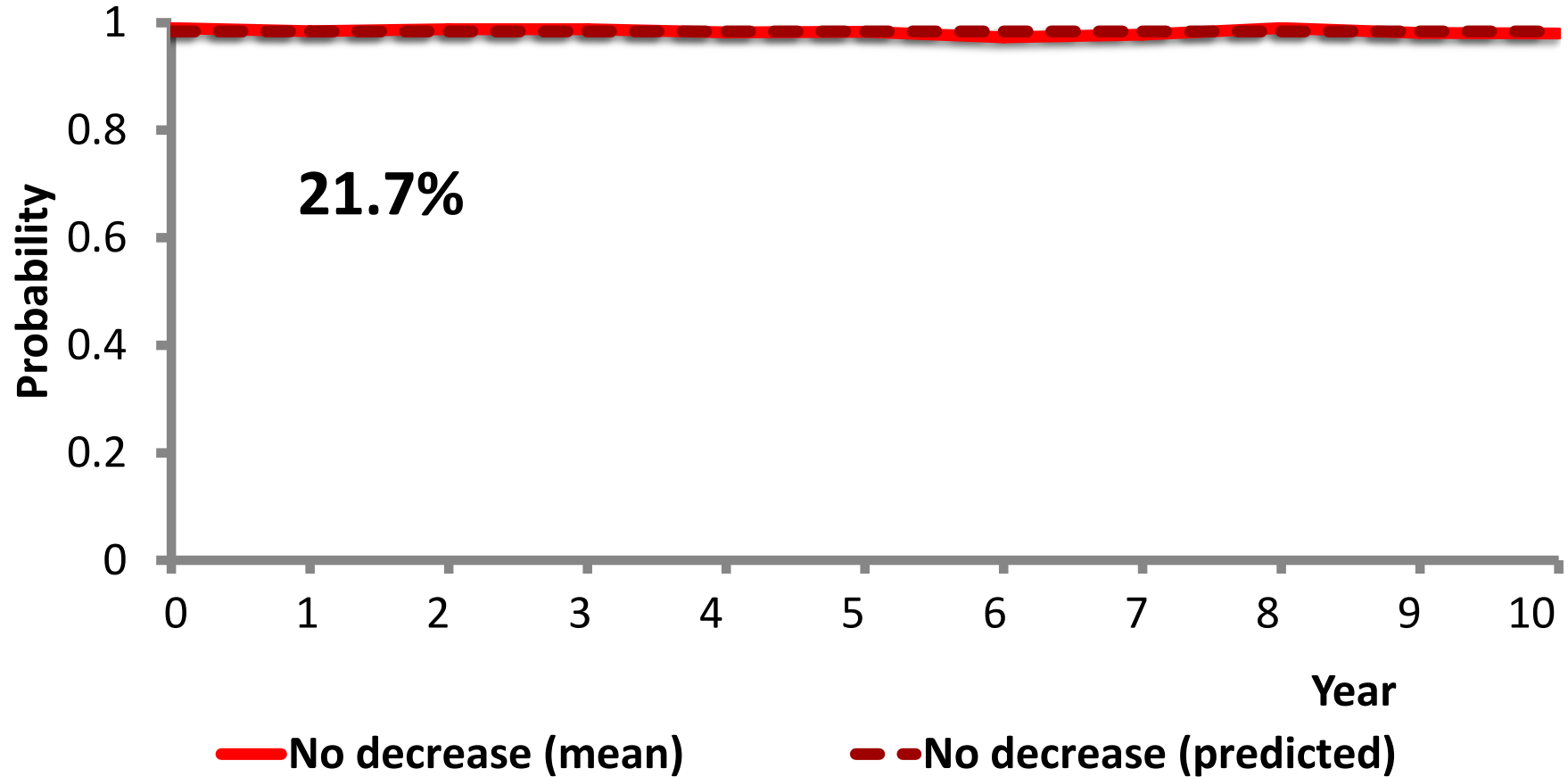
Gradual decrease to near abstinence



Gradual decrease

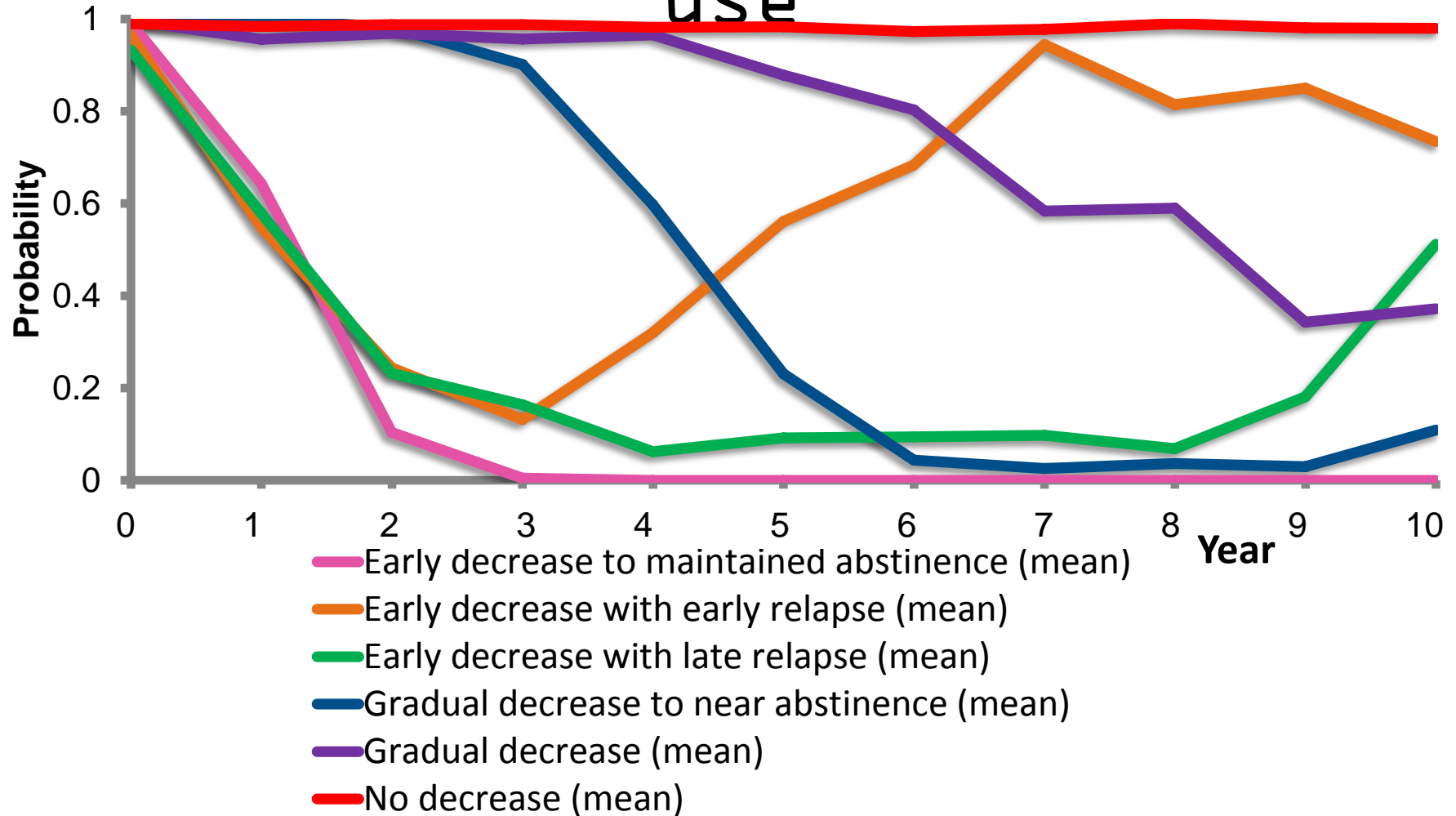


No decrease

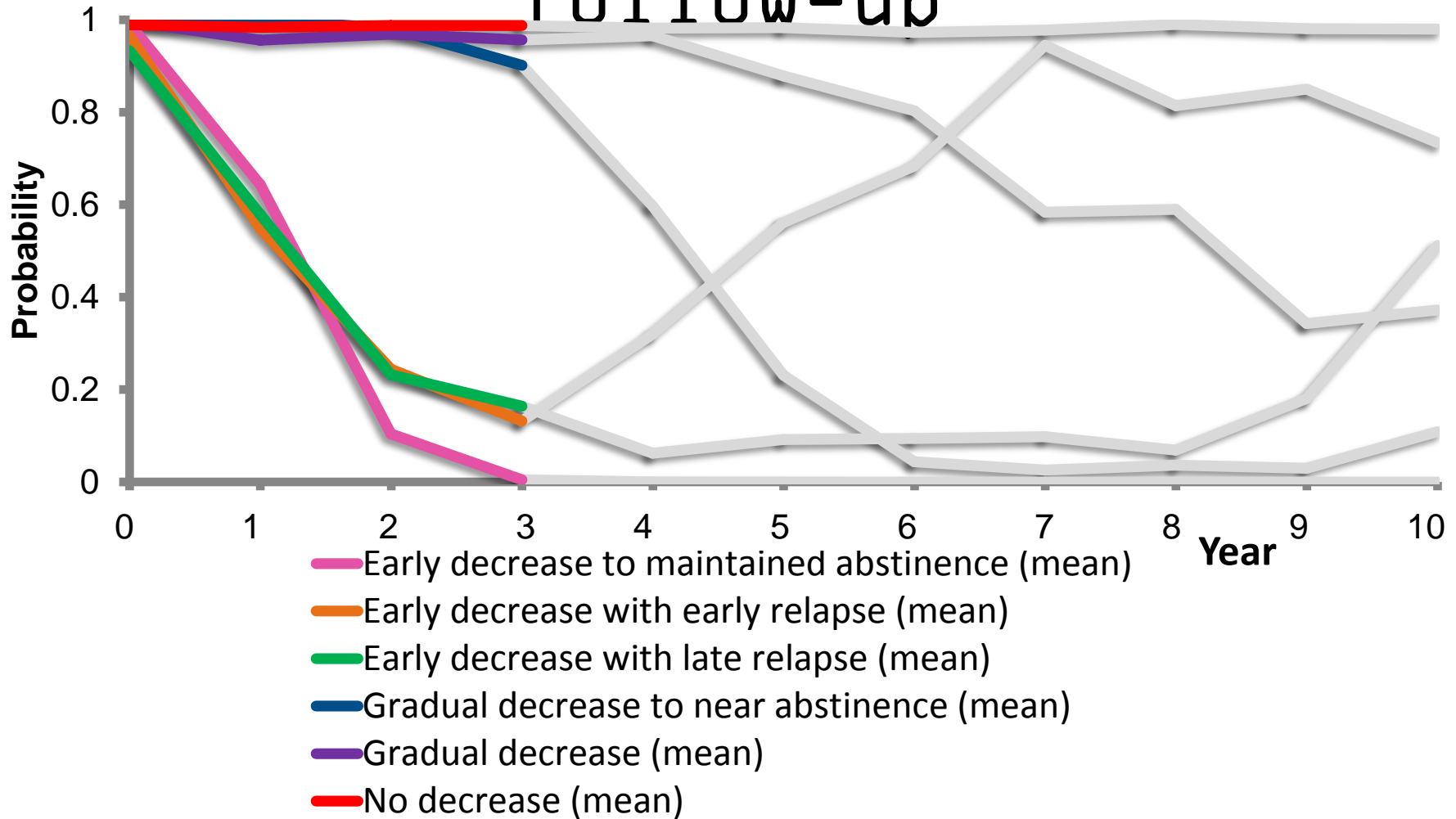


All trajectories of heroin

use



The importance of long-term follow-up



Can we predict a persons trajectory?



- ❖ Aim: to examine factors associated with each trajectory
- ❖ A series of multinomial logistic regressions were conducted on covariates hypothesised to be associated with heroin use trajectories

Factors not associated with trajectories

Demographic characteristics	Drug use history
<ul style="list-style-type: none">• Sex, education• Main source of income• Homelessness• Prison history• Past month criminal involvement at baseline	<ul style="list-style-type: none">• No. drug classes used last month• Types of drugs used last month• History of IDU
Physical and mental health	Treatment history
<ul style="list-style-type: none">• General and physical and mental health• ASPD• BPD• Current and lifetime PTSD• Major depression• Ever attempted suicide• No. traumas	<ul style="list-style-type: none">• In current treatment• Current treatment category• Index treatment category• No. previous rx episodes

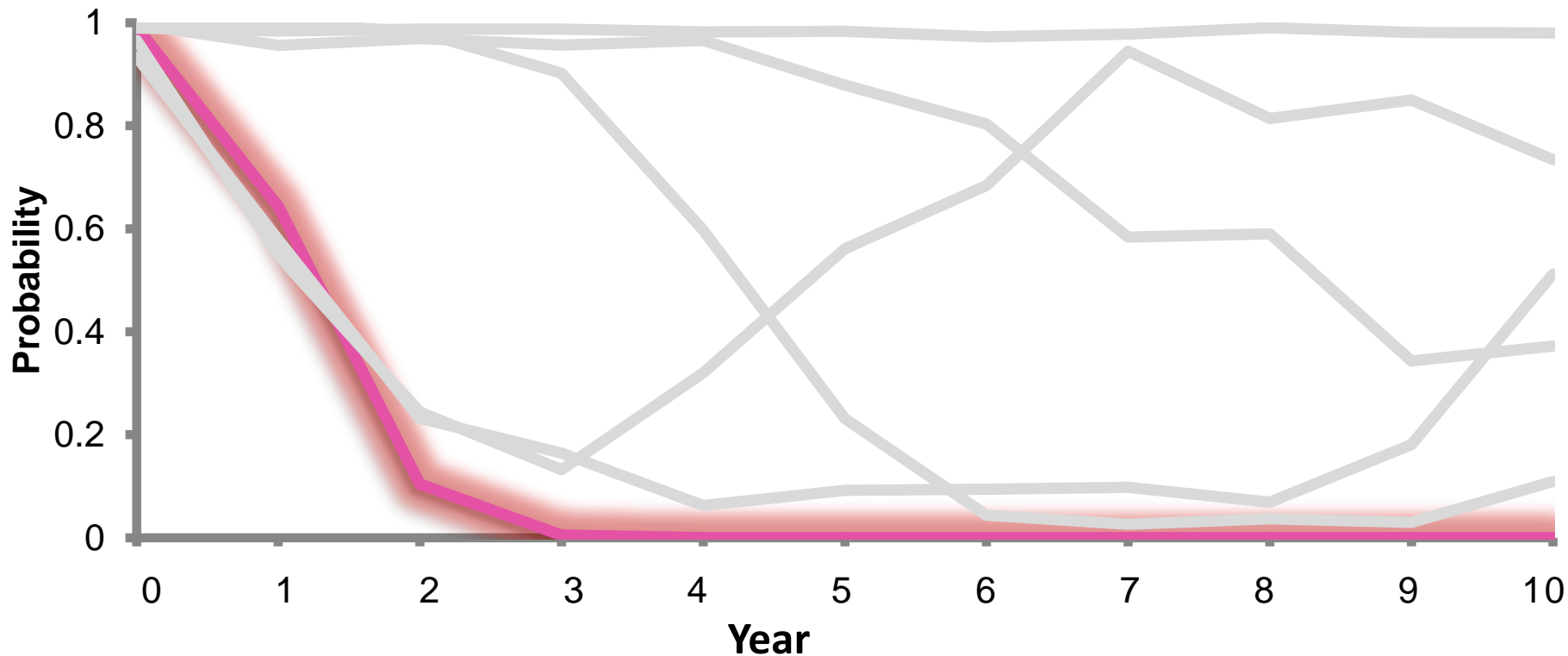
Baseline predictors of trajectories

- ❖ Aged more than 30
- ❖ Been using heroin for less than 10 years
- ❖ Ever overdosed
- ❖ Severe mental health disability
- ❖ Had experienced rape



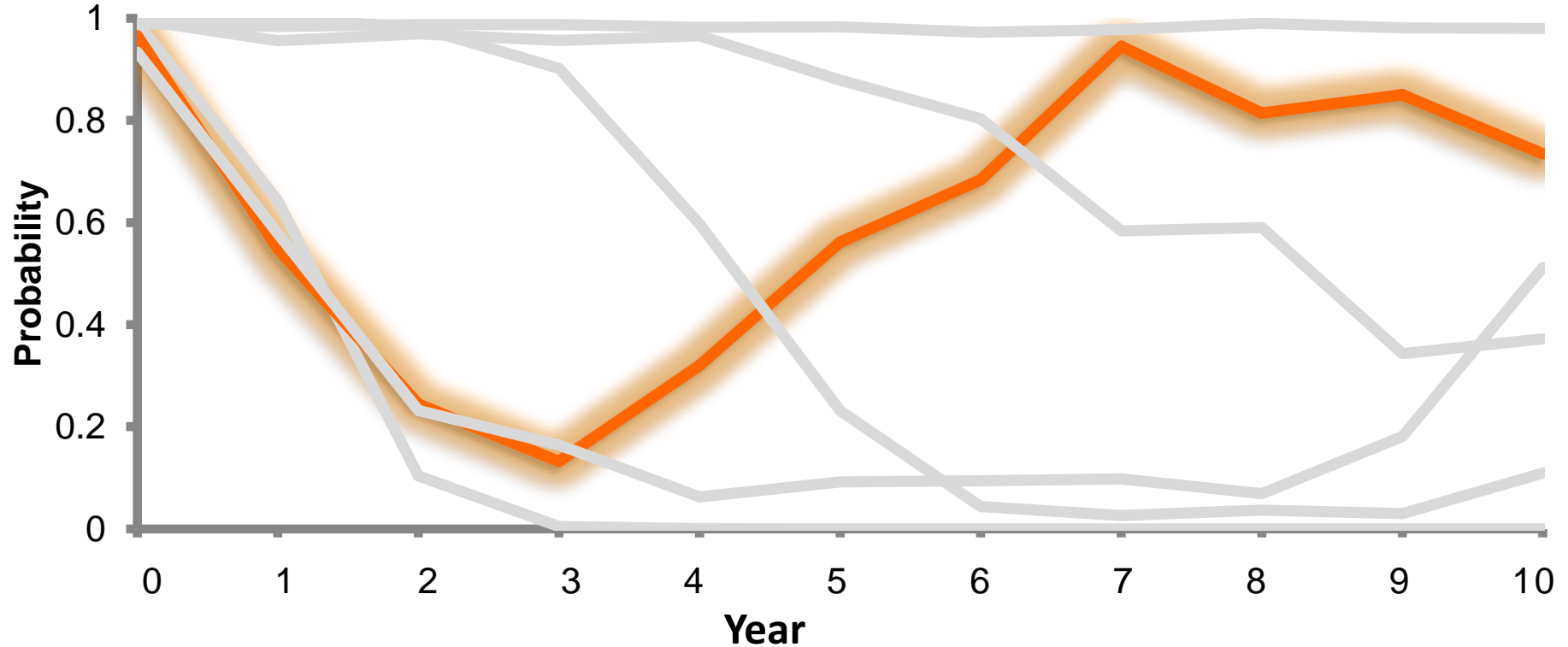
Aged more than 30

- Significantly more likely to be in the **early decrease to maintained abstinence group.**



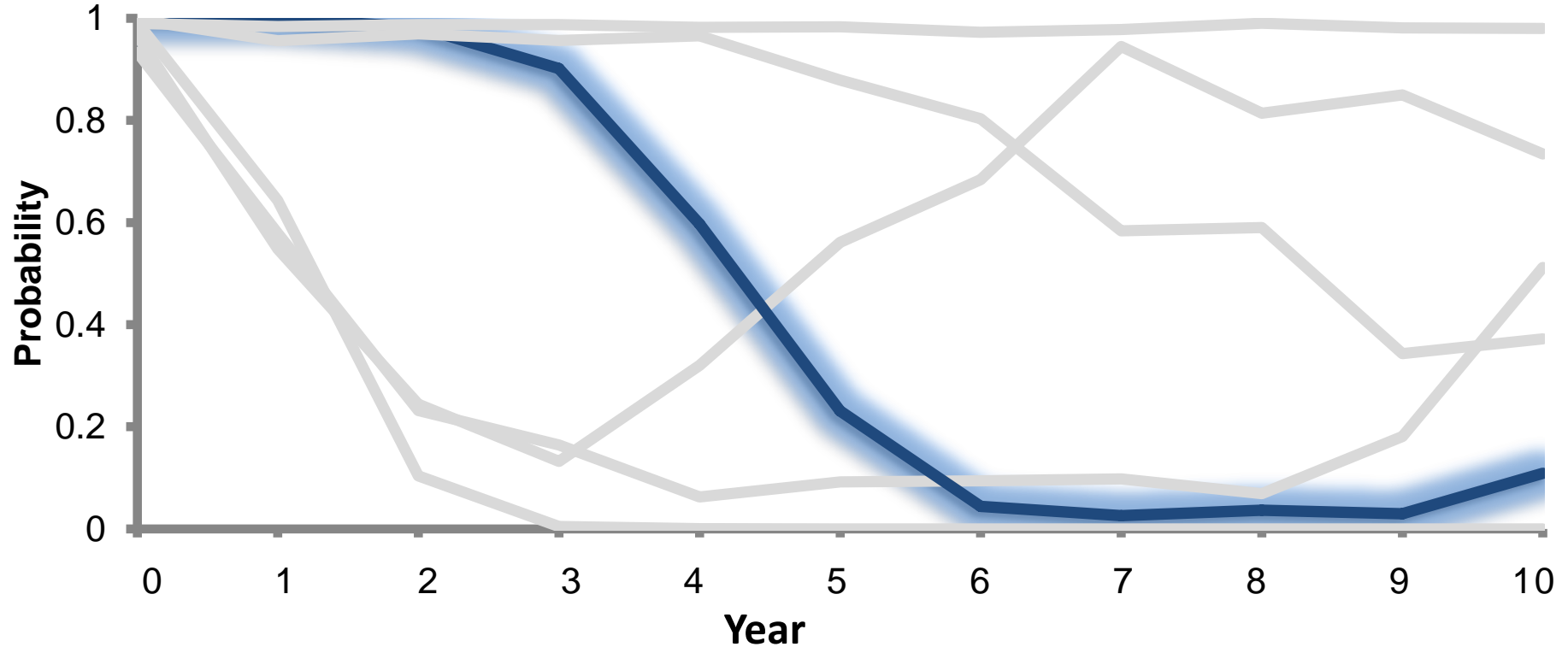
Used heroin less than 10 years

- Significantly more likely to be in the **early decrease with early relapse group**.



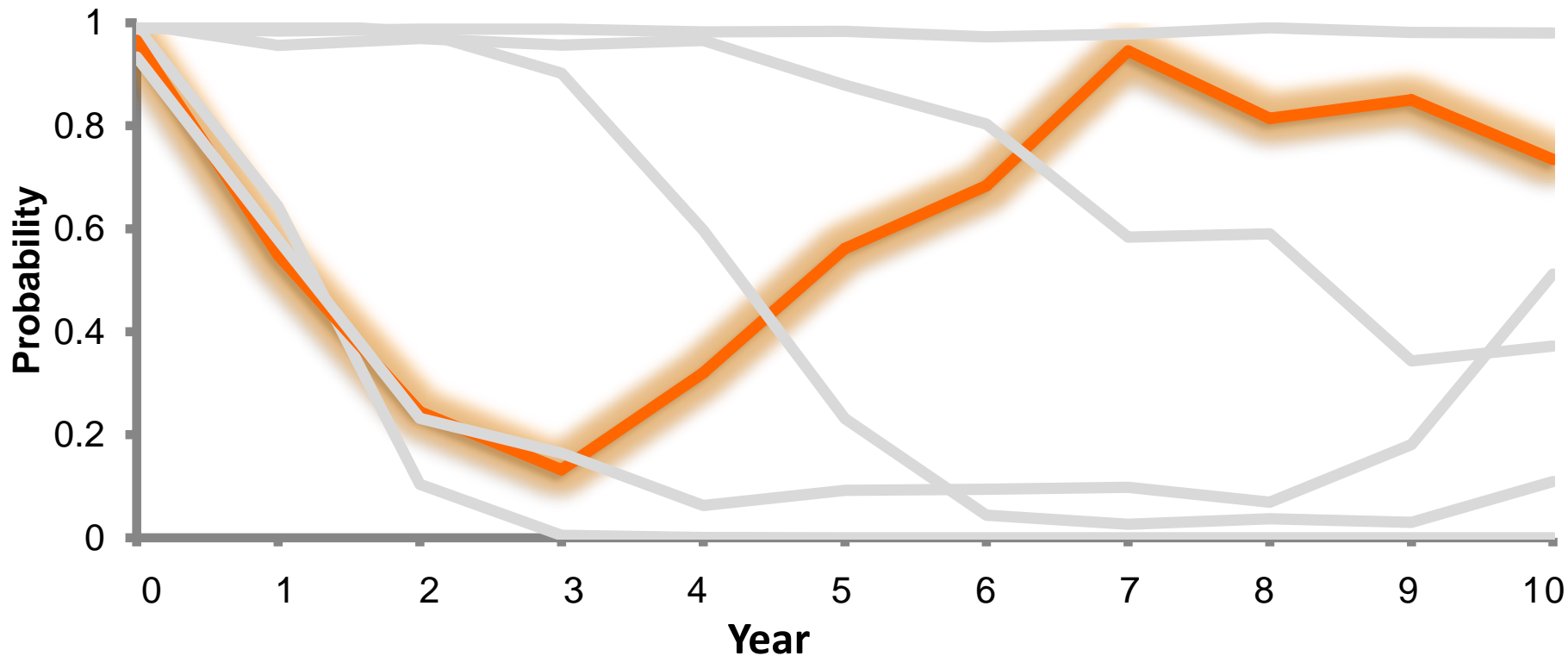
Ever overdosed

- Significantly more likely to be in the **gradual decrease to near abstinence group**.



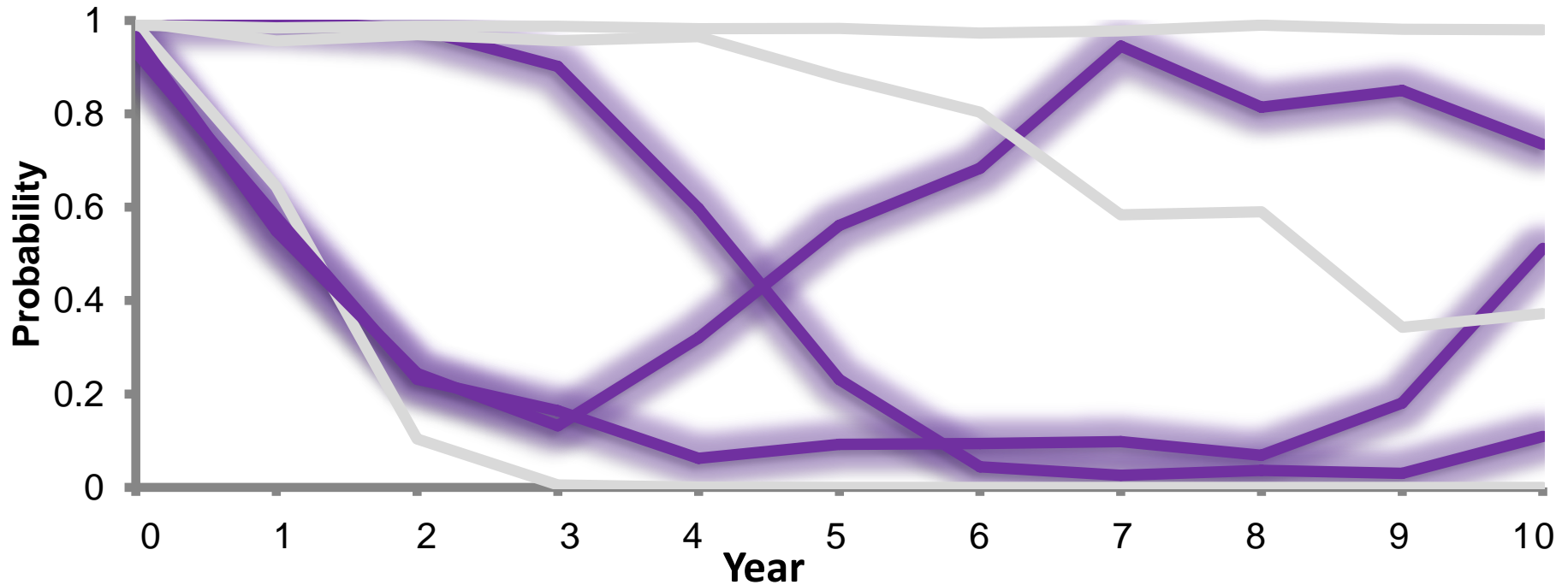
Severe mental health disability

- Significantly more likely to be in the **early decrease with early relapse group**.

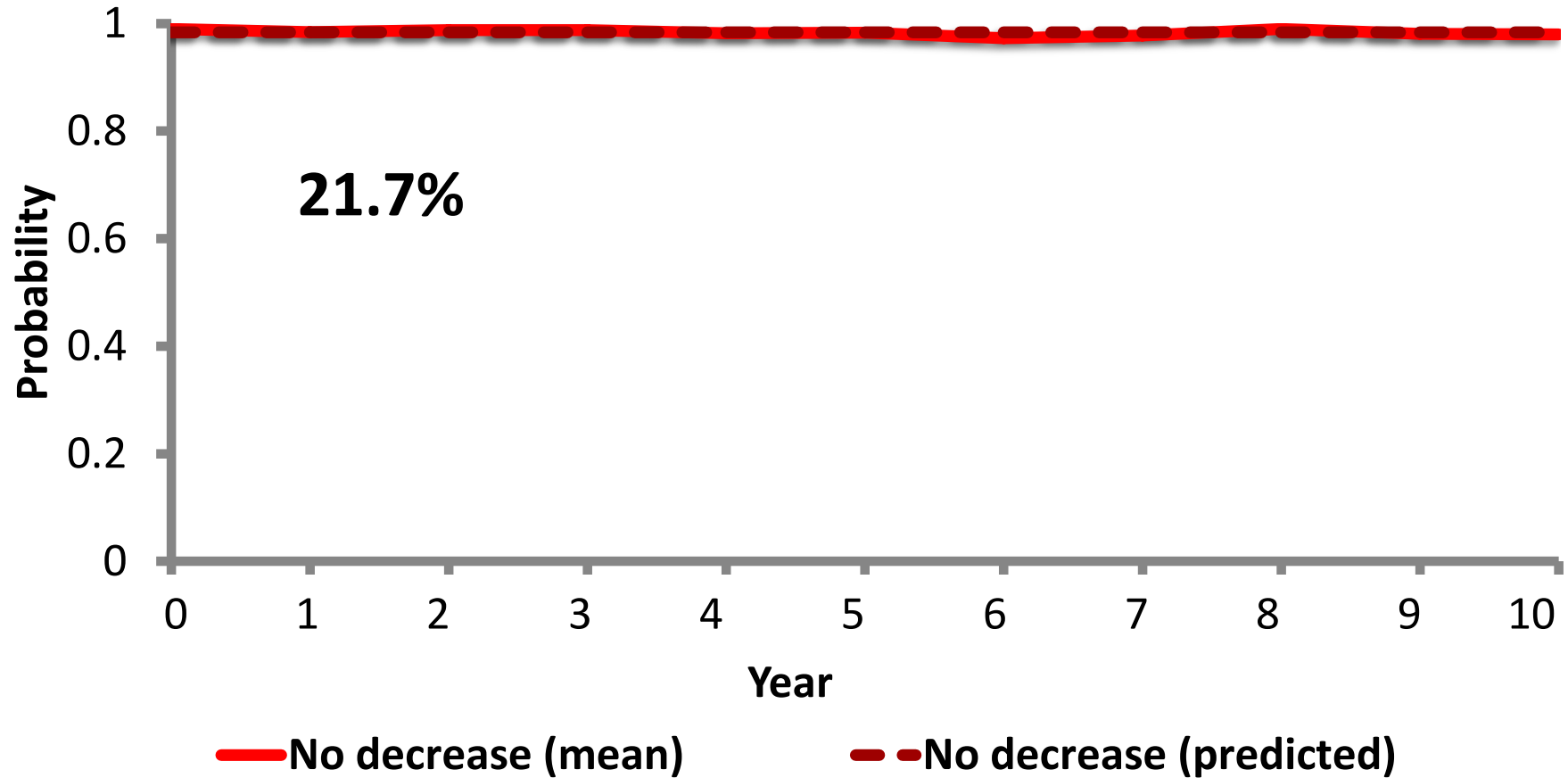


Rape

- Significantly more likely to be in the **early decrease with early relapse group, early decrease with late relapse group, or gradual decrease to near abstinence group.**



Who follows this pathway?



What did we find?

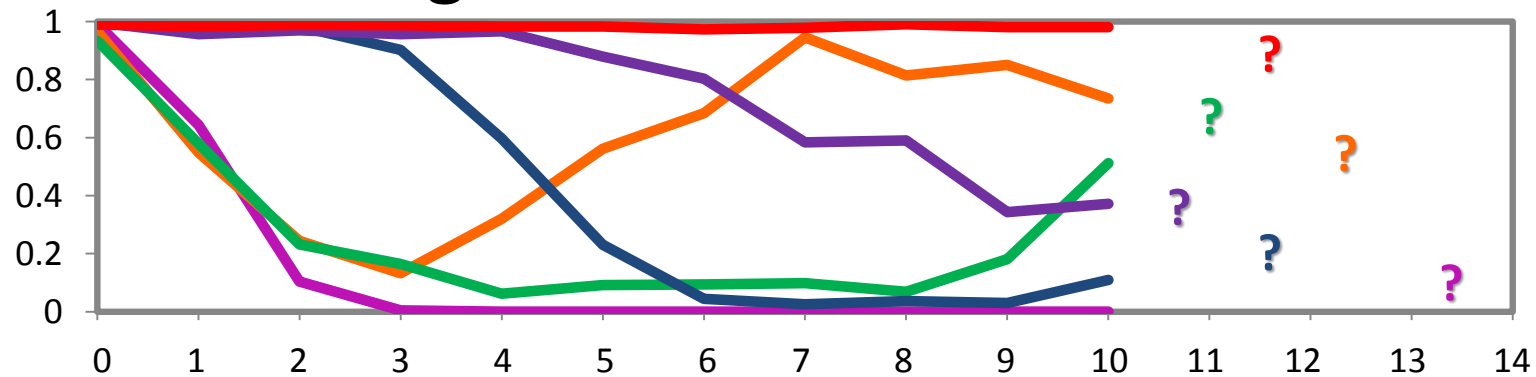


- ❧ Heroin dependence is often a chronic, recurring condition associated with complex trajectories.
- ❧ **More than 80%** of the cohort achieved some level of reduction in their heroin use.
- ❧ It is difficult to predict who will follow a chronic pathway
- ❧ The critical factors guiding trajectories are:
 - ❧ Aged more than 30
 - ❧ Used heroin for less than 10 years
 - ❧ History of overdose
 - ❧ Ever been raped
 - ❧ Severe mental health disability

Future



- Examining how treatment across the 11-year follow-up impacts upon a person's trajectory
- Continued follow-up of the ATOS cohort to examine the pathways of the group as they continue to age



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The screenshot shows the homepage of the NHMRC Centre of Research Excellence in Mental Health and Substance Use. The header includes the center's name and a navigation menu with links: Home, About Us, Research, Our People, Publications, Resources, Training, and Contact Us. A search bar is also present. The main content area features a large image of people walking in a park, with the text "Our research streams: Prevention" below it. To the right, there are two columns: "Latest News" and "Latest Events".

Latest News		Latest Events	
Aug 21	Jaelea Skehan appointed as HIMH Director	Nov 06	Society for the Study of Addiction Annual...
Aug 16	The perfect storm: alcohol, drugs, and depression	Oct 16	WPA Section on Epidemiology and Public Health...
Aug 14	ABC launches Mental As... for Mental Health Week	Sep 08	NDARC Annual Symposium, 8 Sept 2014
Aug 08	Prof Maree Teesson 2014 Eureka Prize Finalist	Sep 05	Comorbid Anxiety and Substance Use: Interventions...

At the bottom of the website, there is a row of logos for partner institutions: UNSW, The University of Newcastle, The University of Sydney, Macquarie University, The University of Birmingham, Northwestern University, and MUSC Medical University of South Carolina.

Thank you!

