

Challenges for the Next 40 Years of Drug Abuse Prevention Research

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Recommendations to Enhance the Contribution of Prevention to Public Health

- **Develop common terminology, methods and measures of program selection and outcome**
- **Develop common analytic approaches to evaluate the effect of prevention programs**
- **Develop stronger empirical basis for identification of high risk samples in targeted programs**
- **Nest levels of prevention within community and cultural contexts**

Robert Wood Johnson Foundation

Conference on Strategies for Prevention of Substance Abuse, 2000

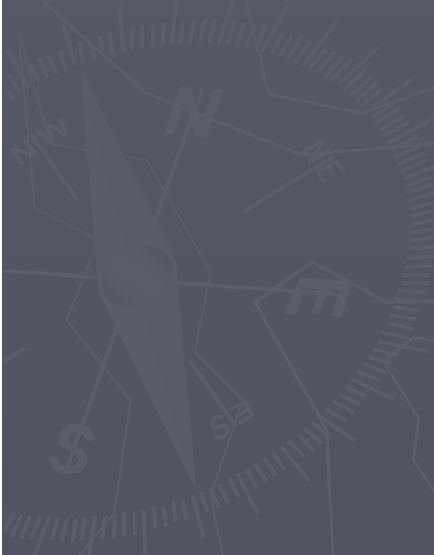
Key Recommendations from NIMH Prevention Work Group

- Integrate advances in neuroscience and behavioral sciences in prevention programs (i.e., pre-prevention and prevention/intervention)
- Shift emphasis to secondary and tertiary prevention
- Decreased boundaries between prevention, intervention, and treatment
- Devote substantial effort to prospective longitudinal research

NIMH Work group on Mental Disorders Prevention Research, 1998

Lingering Issues

(in no particular order)



How to decide if we should target something for prevention messages?

- ▶ strength of the association
 - ▶ high odds ratios, even after controlling for x, y, z
 - ▶ Or, not high odds ratios, but clinically meaningful
- ▶ dose-response relationship
- ▶ replicability
 - ▶ in other cultures, with different study designs
- ▶ temporality
 - ▶ requires lifetime assessment
- ▶ biological plausibility
 - ▶ if it doesn't seem right, it might not be

Issue

- ▶ The World is Flat (T. Friedman, 2005/06)
- ▶ Global issues demand global collaboration—
not restrictions

Issue

- ▶ What are we preventing? Drug use, addiction, or the co-morbid prodromal conditions associated with drug use?
- ▶ Both drug use and the associated conditions are estimated to be around for a long time.
- ▶ We need to be able to better delineate the independent from the dependent variables.

Table 1.3 Leading causes of mortality and disease burden (DALYs) among adults, worldwide, 2002

Mortality – adults aged 15–59

Rank	Cause	Deaths (000)
1	HIV/AIDS	2279
2	Ischaemic heart disease	1332
3	Tuberculosis	1036
4	Road traffic injuries	814
5	Cerebrovascular disease	783
6	Self-inflicted injuries	672
7	Violence	473
8	Cirrhosis of the liver	382
9	Lower respiratory infections	352
10	Chronic obstructive pulmonary disease	343

Disease burden – adults aged 15–59

Rank	Cause	DALYs (000)
1	HIV/AIDS	68 661
2	Unipolar depressive disorders	57 843
3	Tuberculosis	28 380
4	Road traffic injuries	27 264
5	Ischaemic heart disease	26 155
6	Alcohol use disorders	19 567
7	Hearing loss, adult onset	19 486
8	Violence	18 962
9	Cerebrovascular disease	18 749
10	Self-inflicted injuries	18 522

Mortality – adults aged 60+

Rank	Cause	Deaths (000)
1	Ischaemic heart disease	5825
2	Cerebrovascular disease	4689
3	Chronic obstructive pulmonary disease	2399
4	Lower respiratory infections	1396
5	Trachea, bronchus, lung cancers	928
6	Diabetes mellitus	754
7	Hypertensive heart disease	735
8	Stomach cancer	605
9	Tuberculosis	495
10	Colon and rectum cancers	477

Disease burden – adults aged 60+

Rank	Cause	DALYs (000)
1	Ischaemic heart disease	31 481
2	Cerebrovascular disease	29 595
3	Chronic obstructive pulmonary disease	14 380
4	Alzheimer and other dementias	8 569
5	Cataracts	7 384
6	Lower respiratory infections	6 597
7	Hearing loss, adult onset	6 548
8	Trachea, bronchus, lung cancers	5 952
9	Diabetes mellitus	5 882
10	Vision disorders, age-related and other	4 766

Issue

- ▶ Among the range of all disorders or illnesses researched, drug abuse tends to be stigmatized by universities/institutions in the same way drug abuse is stigmatized by society (CTSA).
- ▶ Donors are not coming out of the woodwork to fund endowed chairs for crack cocaine professorships.
- ▶ Is our field at a disadvantage compared to other fields? Are we losing potential recruits to other fields?
- ▶ **How can we change this?**

► Don't we have the responsibility to change this?

- On IRBs
- Work with the community, not use the community
- Car saleswomen (career training/show the next generation that there is a place for them)

Issue

- ▶ Participants are perceived as:
 - Difficult to recruit (maybe, but they are recruitable and we can find out if they differ from others)
 - Hard to retain (96.6% completion after 18 months among IDUs)
- ▶ Assessments are still incomplete (they don't completely measure all of the relevant behaviors).
- ▶ Methods studies are less popular, harder to get funded, yet, the field relies on the products that come from those studies.
- ▶ Diagnostic issues: many substances and criteria, complex etiologic pathways that are not cookie cutter
- ▶ Investigators must be dogged in their pursuit of respondents and the field needs reliable and valid delineation of phenotypes.



Tip of the Iceberg
Phenomenon

Issue

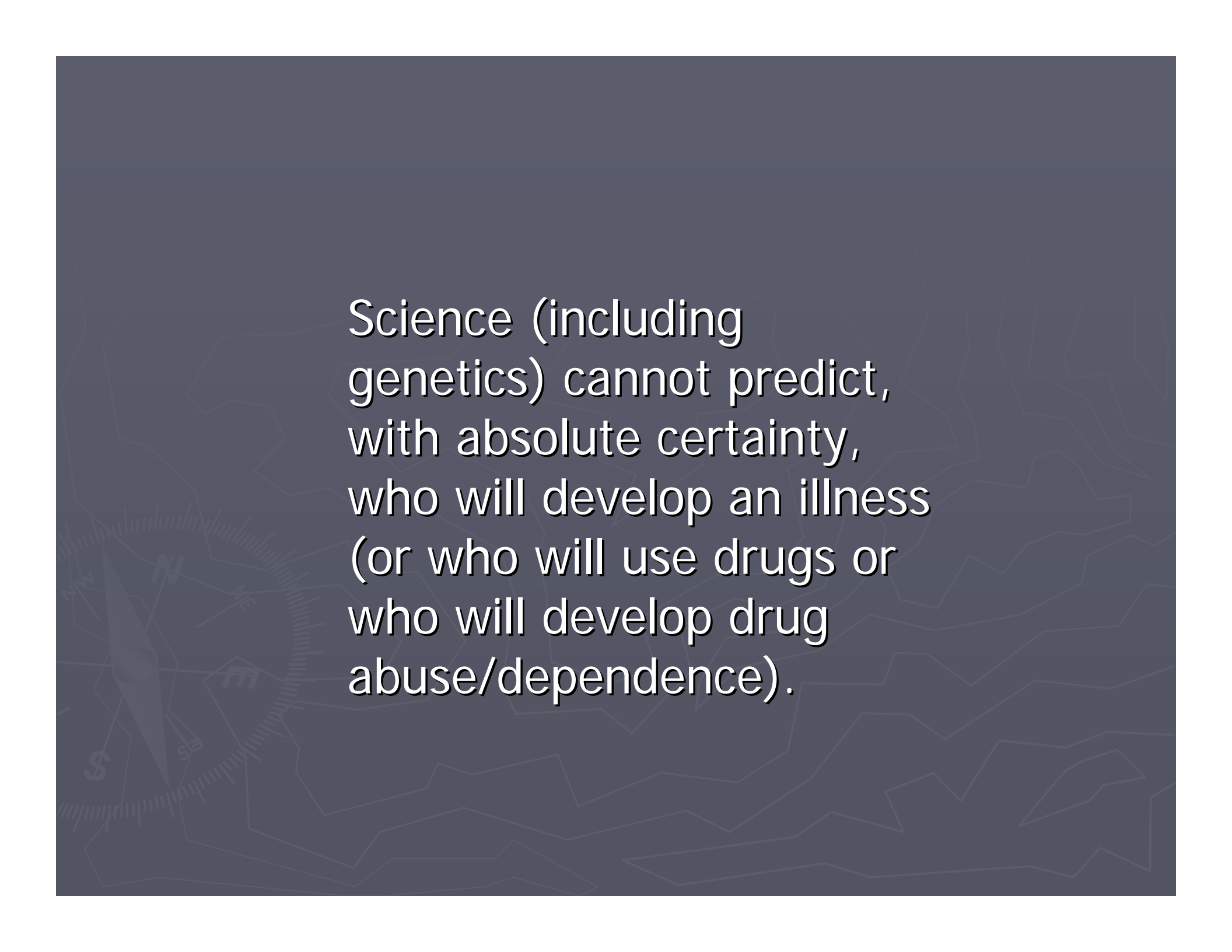
- ▶ Most samples are dead end.
- ▶ Need “cradle to grave” studies, brain images, neurotransmitter extractions before events occur.

How do we know who was reached?

- ▶ **Recruitment Yield:** the % of eligible people enrolled in the study out of *all* people screened, regardless of eligibility; E / SC
- ▶ **Enrollment Yield:** the % of eligible people enrolled in the study out of all *eligible* people screened; E / EC
- ▶ **Precision:** the % of eligible people screened out of all screened; EC / SC

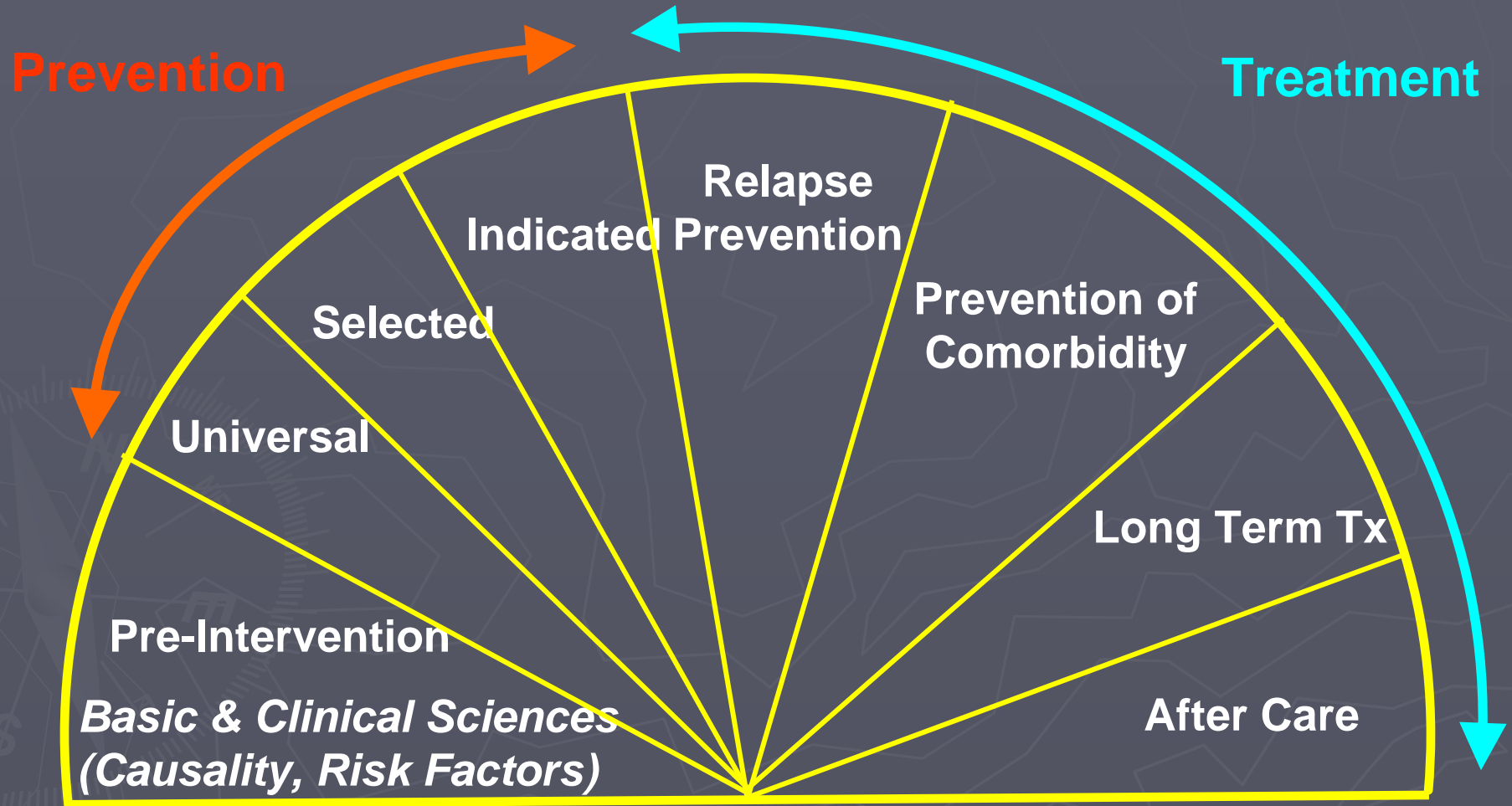
Issue

- ▶ Should we be implementing universal or selected or indicated interventions?



Science (including genetics) cannot predict, with absolute certainty, who will develop an illness (or who will use drugs or who will develop drug abuse/dependence).

Prevention Spectrum



Advantages of Universal Strategies

According to Geoffrey Rose, 1992

- ▶ A large number of people exposed to a small risk may generate more cases than a small number of people exposed to a high risk.
- ▶ Thus, **community strategies** (also called the public health model, or universal prevention) may be more effective than **high risk strategies**.

Benefits of Population Strategies

- ▶ It is powerful in its influence and it is appropriate.
 - Ex: A 10% lowering of cholesterol, can reduce coronary heart disease by 20-30%. CHD kills 25% of the population.
 - The same intervention could reduce strokes, and hypertension.
 - So, for an individual, effects may be small, but cumulative benefits as a whole are large.

Advantages and Disadvantages of Targeted Programs

Advantages

- Potential of addressing problems early
- Potentially efficient

Disadvantages

- Possibilities of labeling and stigmatization
- Difficulties with screening
- Power to predict future disorder usually very weak
- High-risk group contributes many fewer cases than the low-risk group

Offord DR, Addict Behav 2000

Weaknesses of High Risk Strategies

- ▶ Most cases of disease occur among those at lowest risk compared to those who are at highest risk. (UK Heart Disease Prev. Proj, Heller et al, 1984)

	<u>% of men</u>	<u>% MI at f/u</u>	<u>% of MIs in this group</u>
Elevated risk	15%	7%	32%
(68% of the MIs occurred in the lowest-risk group)			
Elevated risk + early SXs	2%	22%	12%
(88% of the MIs occurred in a lower-risk group)			

Issue

- ▶ Design “tailored”, adaptive interventions for high-risk strategies-- not just “one size fits all” approaches.

Prevention Matrix

(Cottler, 2005)

**S
T
R
A
T
E
G
Y**

UNIVERSAL

SELECTED

INDICATED

RISK

PROTECTIVE

**GENETIC
RESULTS**

**BIO
RESULTS**

UNK

UNK

UNK

UNK

PROB

PROB

PROB

PROB

DEF

DEF

DEF

DEF

UNIVERSAL	UNK	UNK	UNK	UNK
SELECTED	PROB	PROB	PROB	PROB
INDICATED	DEF	DEF	DEF	DEF

Issue

- ▶ Adopt treatment approaches similar to other branches of medicine– using staging criteria.

Issue

- ▶ Training the next generation of scientists must be a main priority.
- ▶ In the next decade, 30 to 40% of us will be leaving the workforce.

How to prevent drug abuse in the era of technology, genetics and biology?

- ▶ Must assess the phenotypes accurately--not all drugs are equal
- ▶ Assess the environmental and other risk factors and their associations with illnesses at varying developmental time points
- ▶ Improve methods for following up respondents, so that information does not just include easy to reach respondents

Preventing illness (2)

- ▶ Find ways to integrate imaging studies with prevention. Pre and post intervention data would be needed and not in labs that “simulate reality”.
- ▶ Design “tailored” interventions for high-risk strategies-- not just “one size fits all” approaches.
- ▶ Assess conditions across the lifespan to correctly link the history of behaviors with the biology.

Serendipity

- ▶ Sometimes things just happen that you don't plan. They just plop into your lap.
- ▶ Take a chance.
- ▶ Do something unplanned.
- ▶ Say "yes".

- ▶ Such opportunities can turn into life changing experiences.