Equity Benchmarking: An Innovative Model for Data Analysis

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A Brief Introduction of
the Diversity Scorecard Project

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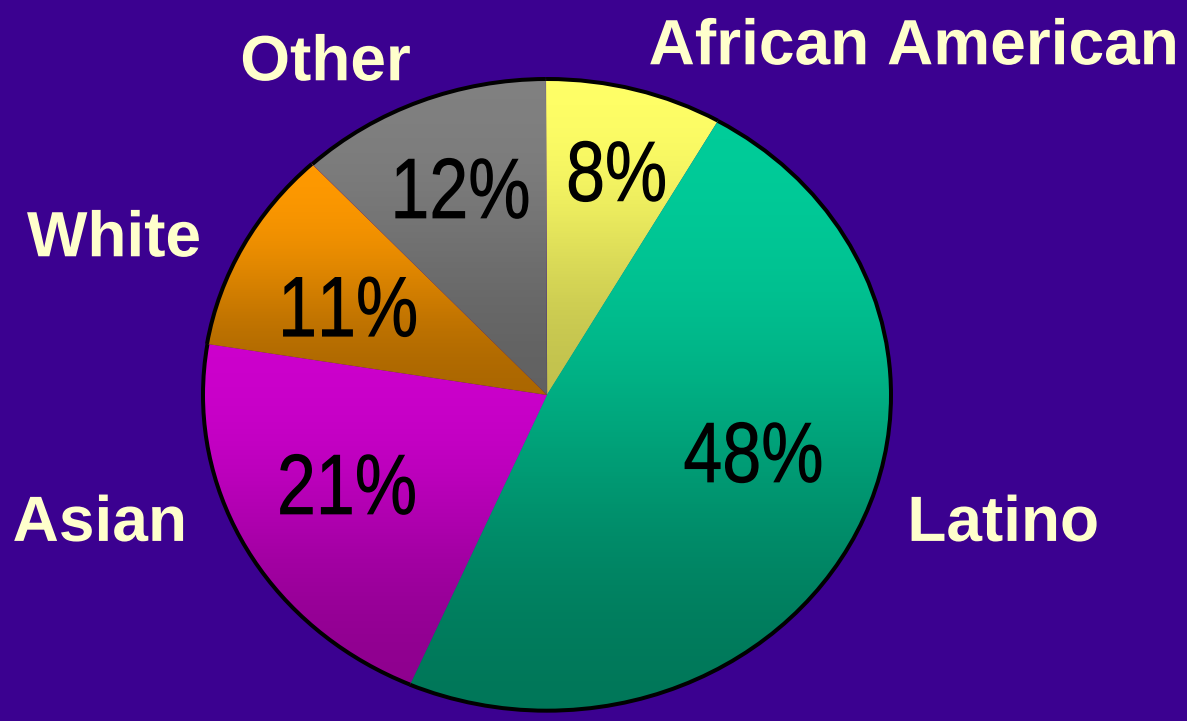
Institution Example

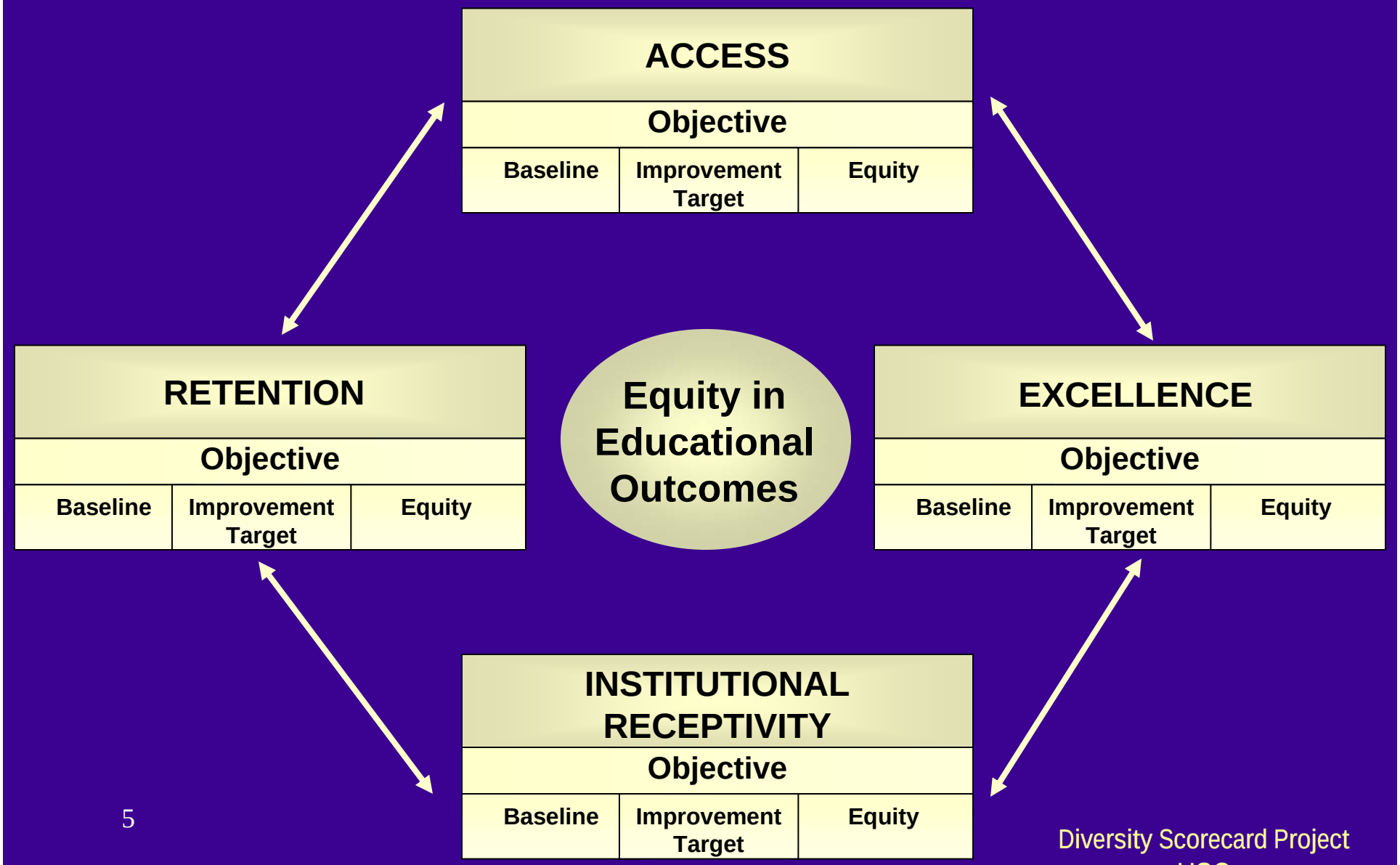
Undergraduate Enrollment



The Diversity Scorecard Project

- A partnership with 14 postsecondary institutions in Southern California
- Equity
- Use of data: disaggregating data by race and ethnicity
- Examining data using fine-grained measures under the four perspectives
- Bringing about institutional change
- The Academic Equity Index

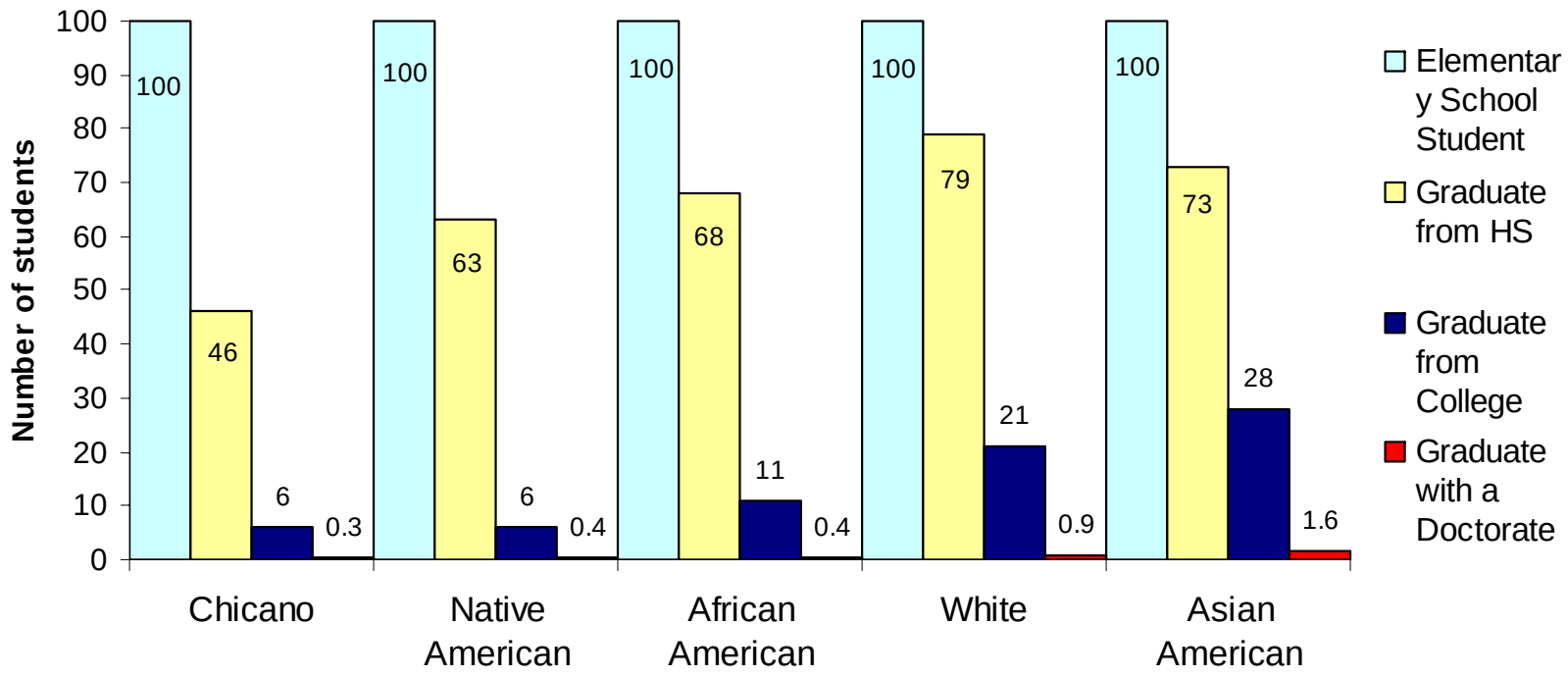
The Diversity Scorecard Framework



What did educational data tell us?

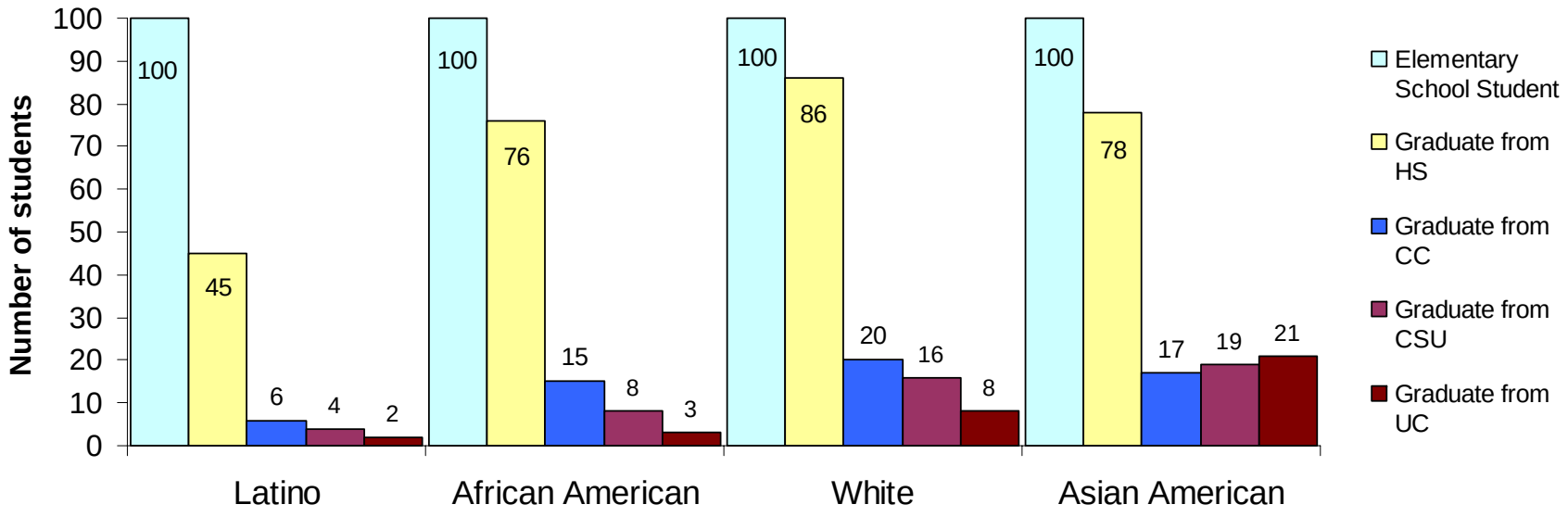
Leakage along the educational pipeline: the nation and California

The U.S. Educational Pipeline 1994



Source: U.S. Census, 1994; Doctorate Recipients from U.S. Universities Summary Report, 1990

The California Educational Pipeline 1998

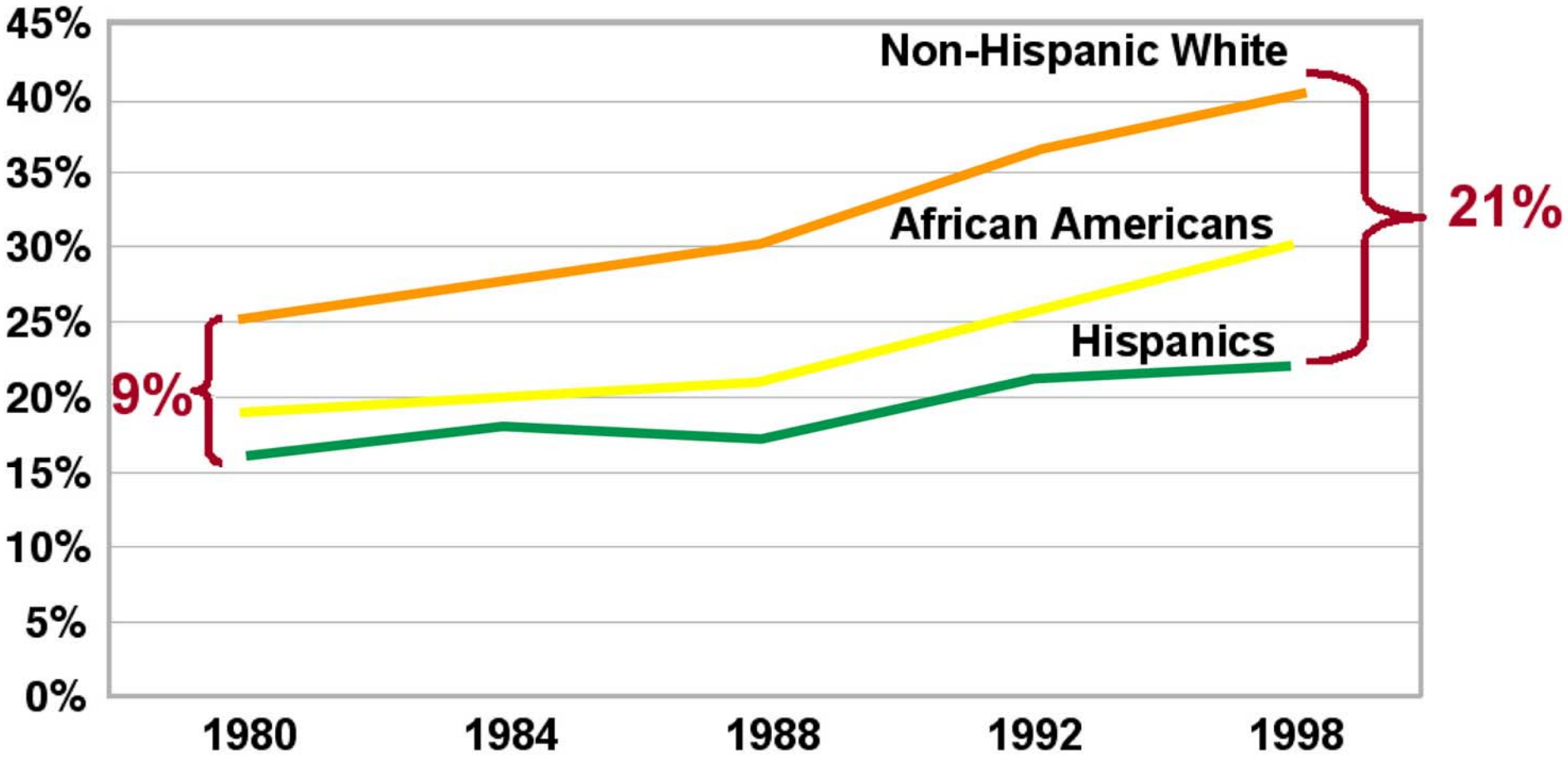


Source: Solorzano, D., University of California, Los Angeles, 1996

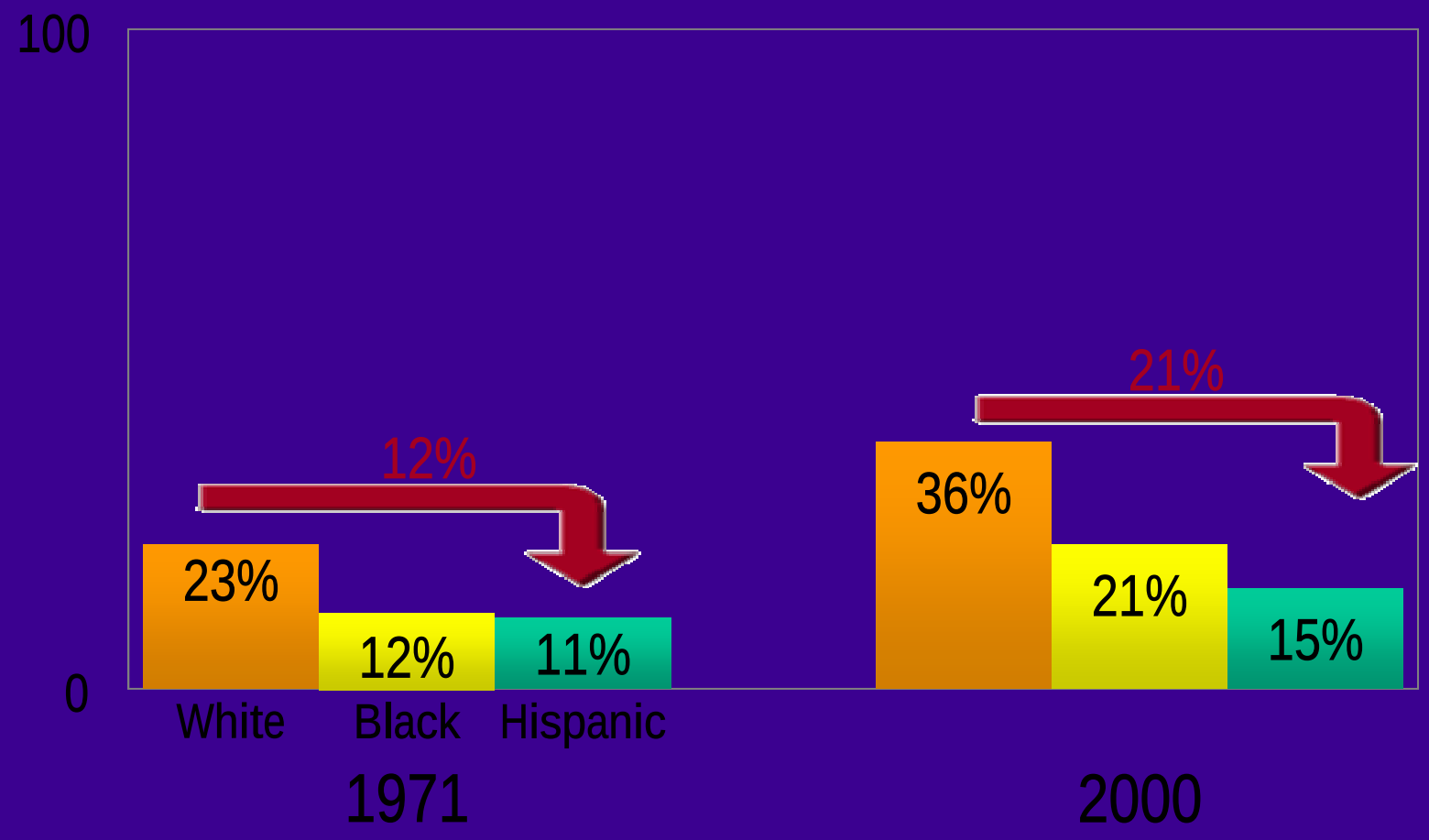
Progress vs. Widening Gap

Progress has been made, but the equity gap widened in the same time, **both in postsecondary education access and baccalaureate degree attainment**.

College Enrollment Rates of 18-24 Year Olds by Race/Ethnicity

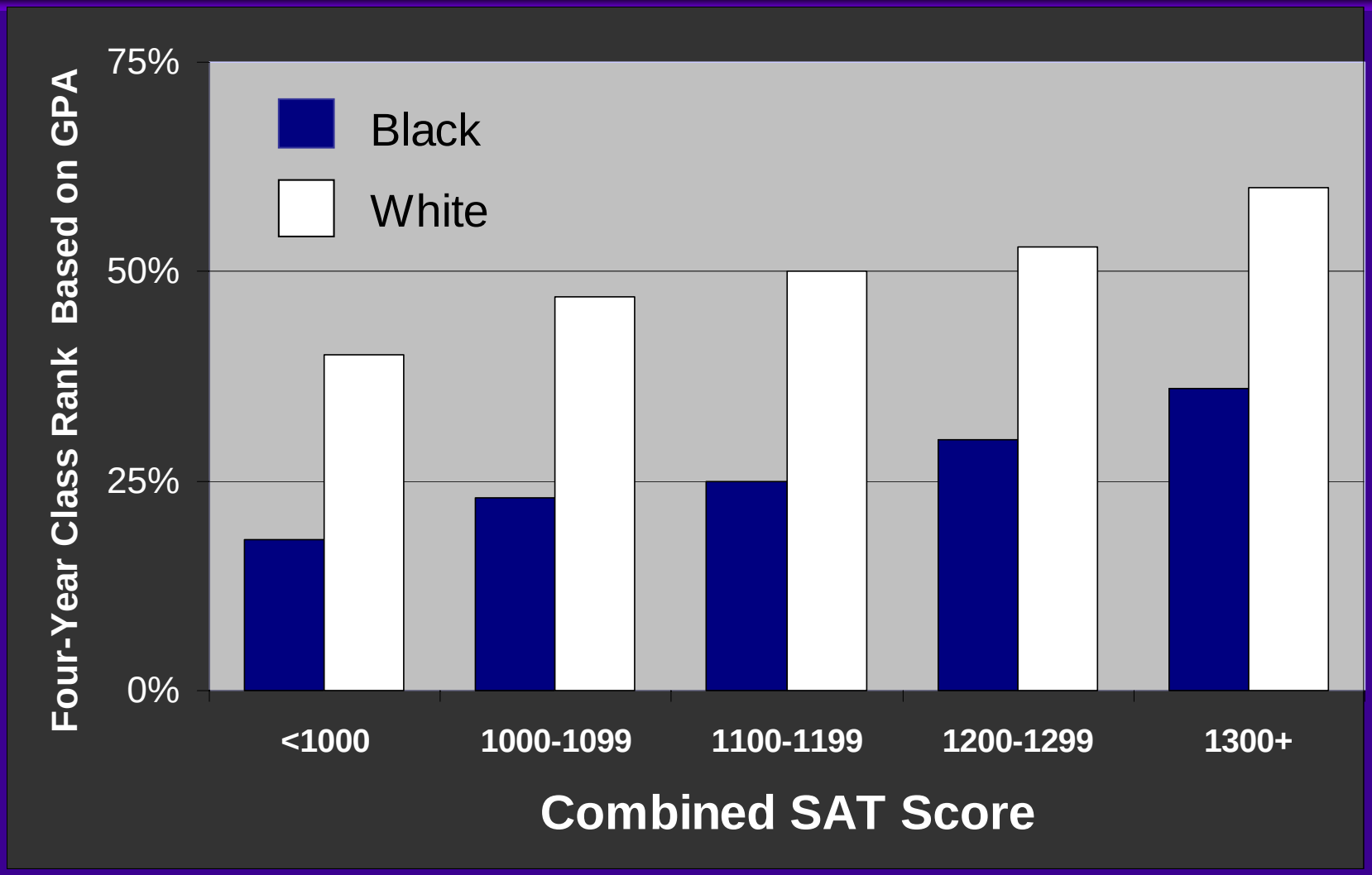


Bachelor's Degree or Higher among High School Completers



Access vs.
Equitable Educational Outcome

Access versus Equity



Source: Bowen, W. G. and D. Bok (1998). The shape of the river: Long-term consequences of considering race in college and university admissions. Princeton, Princeton University Press.

How do we know about the equity status?

- The equity notion
- The Academic Equity Index
- Share vs. rate
- An example of Excellence (the Dean's list)

The Academic Equity Index

Target Group's *Equity Index* for the educational outcome =

$$\frac{\text{Target group's educational outcome / Total students with the educational outcome}}{\text{Target group in the reference population / Total students in the reference population}}$$

Equity being 1.0

Calculating the Academic Equity Index:
The CSU-BA Attainment Equity for Latinos

Educational Outcome

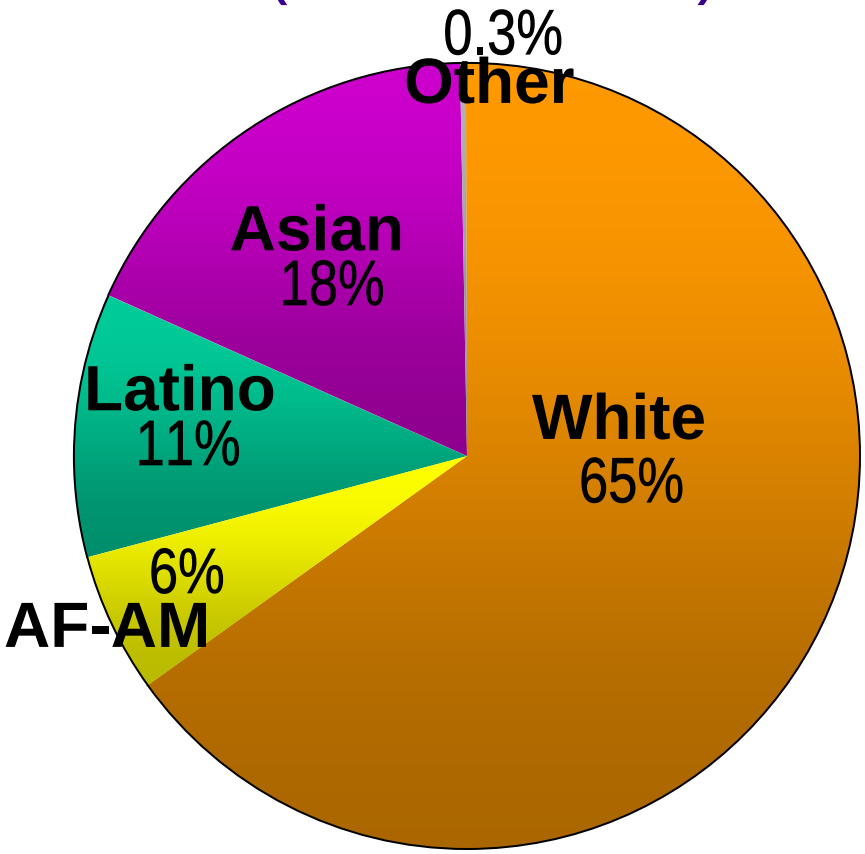
CSU BA recipients 1990-1999	**64,928 Latinos / 529,604 Total**	→ **12.258%**
20-24 age group in CA 1990-1999	**8,218,460 Latinos* / 23,105,427 Total**	→ **35.569%**

Reference Population

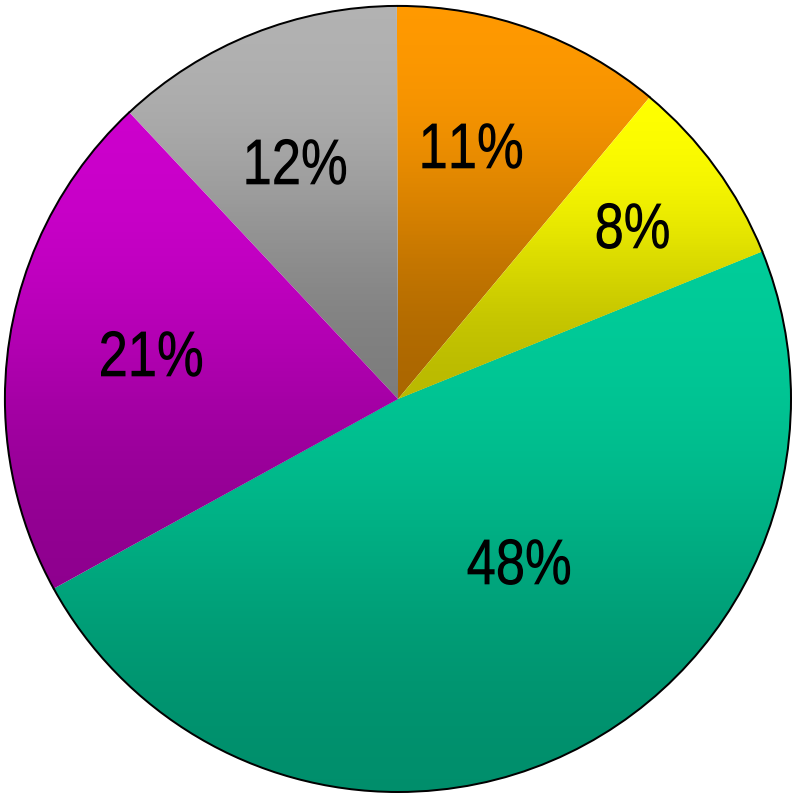
= **.345**

* All Hispanics (of any race)

The Dean's List
(the numerator)



Undergraduates
(the denominator)



The Equity Index Scores

- White: 65% / 11% = 5.909
- Asian: 18% / 21% = 0.857
- African American: 6% / 8% = 0.750
- Latino: 11% / 48% = 0.229
- Other: 0.3% / 12% = 0.025

- "1.000" indicates equity

Why use the Equity Index?

- Internal benchmarking
- Analyzing routine institutional data from equity perspective
- **The goal is to reach equity – 1.0**

Student Profiles

STUDENT PROFILE 5-4 (B)
(formerly 5-11)

SECTION 5 - STUDENT OUTCOMES

Baccalaureate Degrees Awarded at the California State University by Ethnicity, 1989-90 through 1998-99

Full Year	Total	Asian/ Pacific Islander	Black	Filipino	Latino	Native American	Other	White	Total, Declared Ethnicity	Non-Resident Alien	No Response
1989-90	48,105	4,786	1,621	940	3,902	444	896	31,626	44,215	1,628	2,262
1990-91	50,130	4,856	1,696	1,101	4,220	404	937	31,337	44,551	3,322	2,257
1991-92	53,665	5,566	1,939	1,242	4,968	447	1,044	33,785	48,991	1,851	2,823
1992-93	55,665	5,924	2,127	1,491	5,420	470	1,238	32,757	49,427	3,052	3,186
1993-94	55,358	6,165	2,168	1,499	6,238	501	1,298	32,019	49,888	1,969	3,501
1994-95	53,507	6,459	2,300	1,664	6,685	545	1,344	29,132	48,129	1,864	3,514
1995-96	52,730	6,859	2,419	1,771	7,424	488	1,354	26,872	47,187	1,705	3,838
1996-97	52,213	7,094	2,523	1,845	8,056	513	1,404	25,041	46,476	1,795	3,942
1997-98	53,496	7,448	2,716	2,031	8,618	558	1,503	24,530	47,404	1,967	4,125
1998-99	54,814	7,581	2,758	2,122	9,402	588	1,653	24,252	48,356	1,936	4,522

California Postsecondary Education Commission (2000). *Student Profiles, 2000.* Sacramento, CA: the author.

California's Academic Equity Scorecard

At or Above Equity 1.0 or >	Almost Equity 0.8 – 0.9	Below Equity < .8

Perspectives		Equity indicators		Equity Scorecard White	Black	Asian	Latino
Access	1	12th graders who fulfill A-G requirements vs. K-12 enrollment, 1988-2001		1.3	0.7	2.1	0.5
	2	Undergraduate enrollment vs. high school graduates, 1998-2001	CCC	1.0	1.0	0.9	0.7
	3		UC	0.9	0.5	2.4	0.4
	4		CSU	0.9	0.8	1.2	0.6
	5		Indep. colleges	1.2	0.8	1.1	0.4
	6	Needing remediation upon entrance vs. Number of freshman in CSU, 2000-02*	Math	0.8	1.7	0.8	1.4
	7		English	0.6	1.4	1.4	1.3
	8	CCC students transferring to	UC vs. CCC 1988-2002	1.0	0.4	1.9	0.6
	9		CSU vs. CCC 1988-2002	1.0	0.7	1.1	0.8
	10		Indep. colleges vs. CCC 1991-2000	1.2	1.1	1.0	0.7
Retention	11	Degrees vs. 20-24 age group in CA, 1990-1999	AA in CCC	1.3	0.8	0.8	0.5
	12		BA in UC	1.2	0.4	1.9	0.3
	13		BA in CSU	1.3	0.5	1.0	0.3
	14		BA in indep. colleges	1.5	0.6	1.0	0.3
Excellence	15	BA degrees vs. Undergraduate enrollment, 1988-2001	UC Engineering vs. UC	0.9	0.4	1.2	0.4
	16		CSU Engineering vs. CSU	0.9	0.4	1.8	0.5
	17	Doctorate degrees 1988-2001	UC vs. UC	1.3	0.5	0.3	0.3
	18		Indep. vs. independent colleges	1.0	0.6	0.6	0.3
Institutional Receptivity	23	UC faculty composition vs. student enrollment, 2002	Faculty composition	2.1	0.8	0.4	0.4
	24		New appointments of faculty	2.0	1.0	0.5	0.5
	25	CCC staff composition vs. CC student enrollment, 2002	CCC tenure/tenure track faculty	1.8	0.9	0.6	0.4
	26		CCC educational administrators	1.6	1.4	0.4	0.5

* the direction of the measure is opposite to others, so a value greater than 1 indicates inequity.

The Numerator and Denominator

- What to consider in the numerator and denominator?
- Numerator: research interest
- Denominator: finer-grained measures
- Go back to the UC faculty example…
  - Available pool…
  - Doctor degree recipients…

Multi-layer Inequity

- An example: Latino student's equity status on the degree attainment in Math and Science majors
- 10% in degrees obtained in math and science majors
- 15% in math and science majors
- Equity index:

  10% / 15% = 0.667
- Not that bad… not far away from 1.0…

Multi-layer Inequity

Latino's share among…

→ High school graduates from major feeder schools (40%)

→ A-G completers (28%)

→ The college enrollment (30%)

→ Math and Science majors (14%)

→ Each cohort in Math and Science (15%)

→ Baccalaureate degrees in Math and Science majors (10%)

The Shrinking Funnel

High school graduates

High School A-G Completers

The 4-yr college enrollment

Math and Science majors

Degrees in Math and Science majors

Minority-Majority Inequity

An Example: Enrollment and Pass in a gateway course

	Latino	Black	White	Asian	Total
# of Students Enrolled	107	23	35	19	184
# of Students Passed	42	15	29	14	100

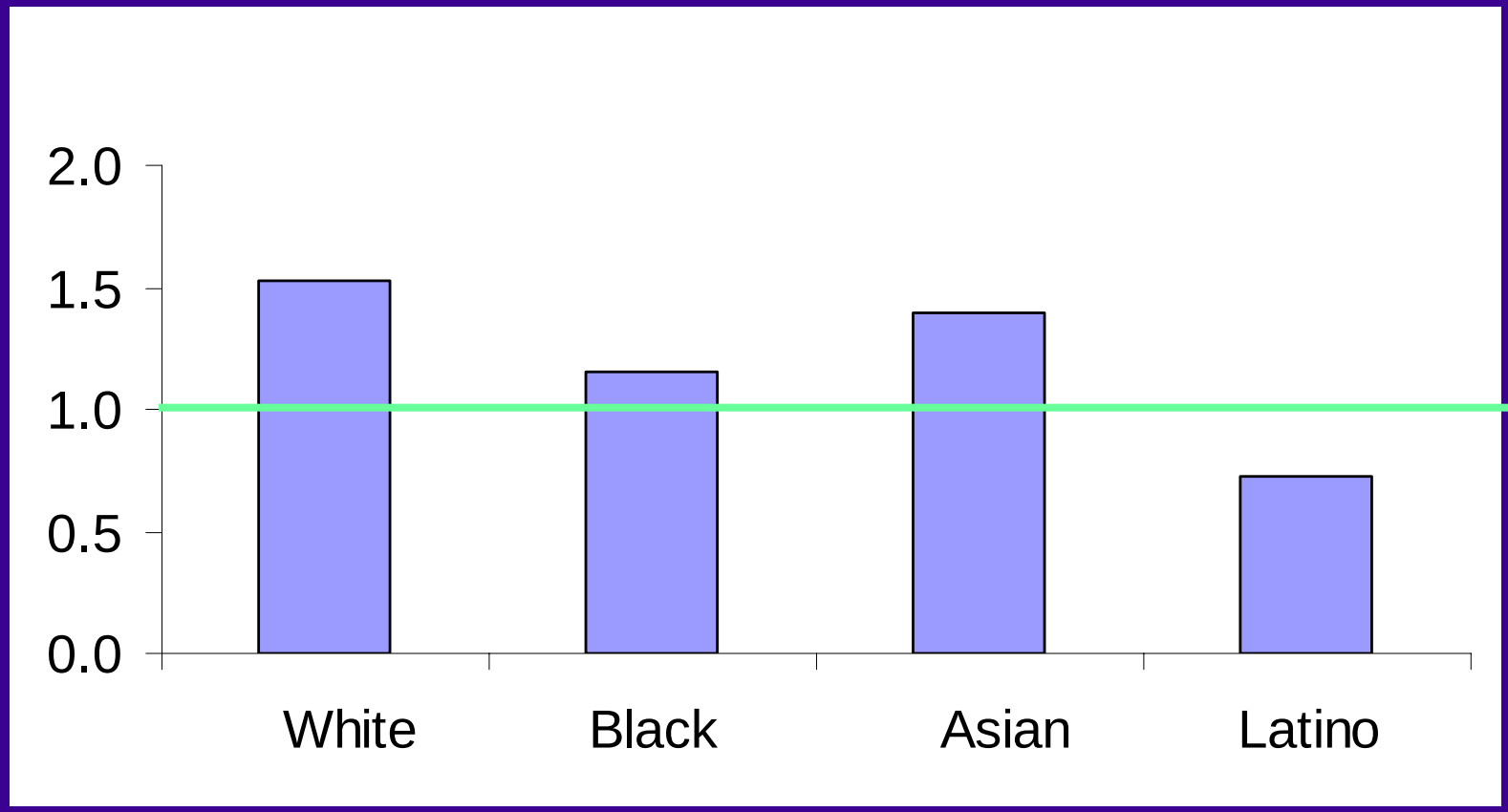
Shares in two pies…

	Latino	Black	White	Asian	Total
Among Students Enrolled - denominator	58%	13%	19%	10%	100%
Among Students Passed - numerator	42%	15%	29%	14%	100%

Equity Index Scores

	Equity Index
White	1.526
Black	1.154
Asian	1.400
Latino	0.724

Equity Indices by ethnicity



If comparing passing rate…

	Latino	Black	White	Asian	Average
Passing Rate by ethnicity	39%	65%	83%	74%	54%

Share vs. Rate, again

A list of fine-grained measures from the Diversity Scorecard project

Measures typically expressed as shares…

- Student enrollment: institution & majors
- Dean's list
- Composition of financial aid recipients
- Students needing remediation in Math and English
- Baccalaureate degree recipients
- Faculty composition
- Faculty new appointments composition

Other Measures…

- Admittance and yield rate
- Passing rate in gateway courses
- Semester to semester persistence rate
- One-year retention rate
- GPA distribution for a certain ethnicity
- Graduation rate
- (for CC) Transfer rate to 4-year college

GPA Distribution for Graduating Seniors

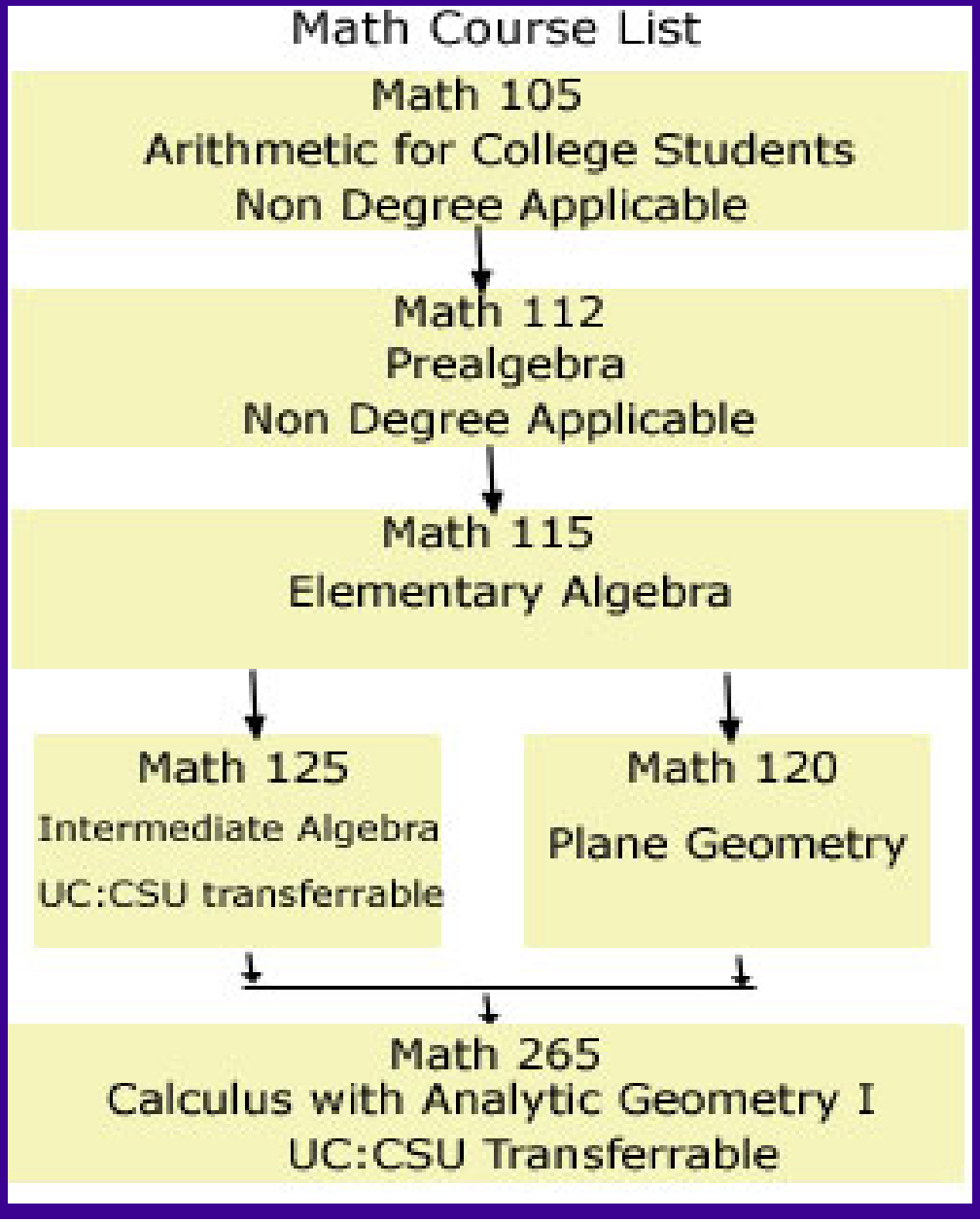
	>3.5	3.0-3.49	2.5-2.99	<2.49	
African Americans	8%	22%	33%	38%	=71%
Latinos	9%	34%	32%	26%	=58%
Asians	22%	38%	25%	15%	=40%
Whites	23%	40%	23%	14%	=37%

How do we decide?

- Which type of % is easier to understand and be understood?
- Which method is the most appropriate given the purpose?
- How about trying both ways?

  -- a case study of math course-taking pattern of Latino students in a community college

Math course-taking in a Community College

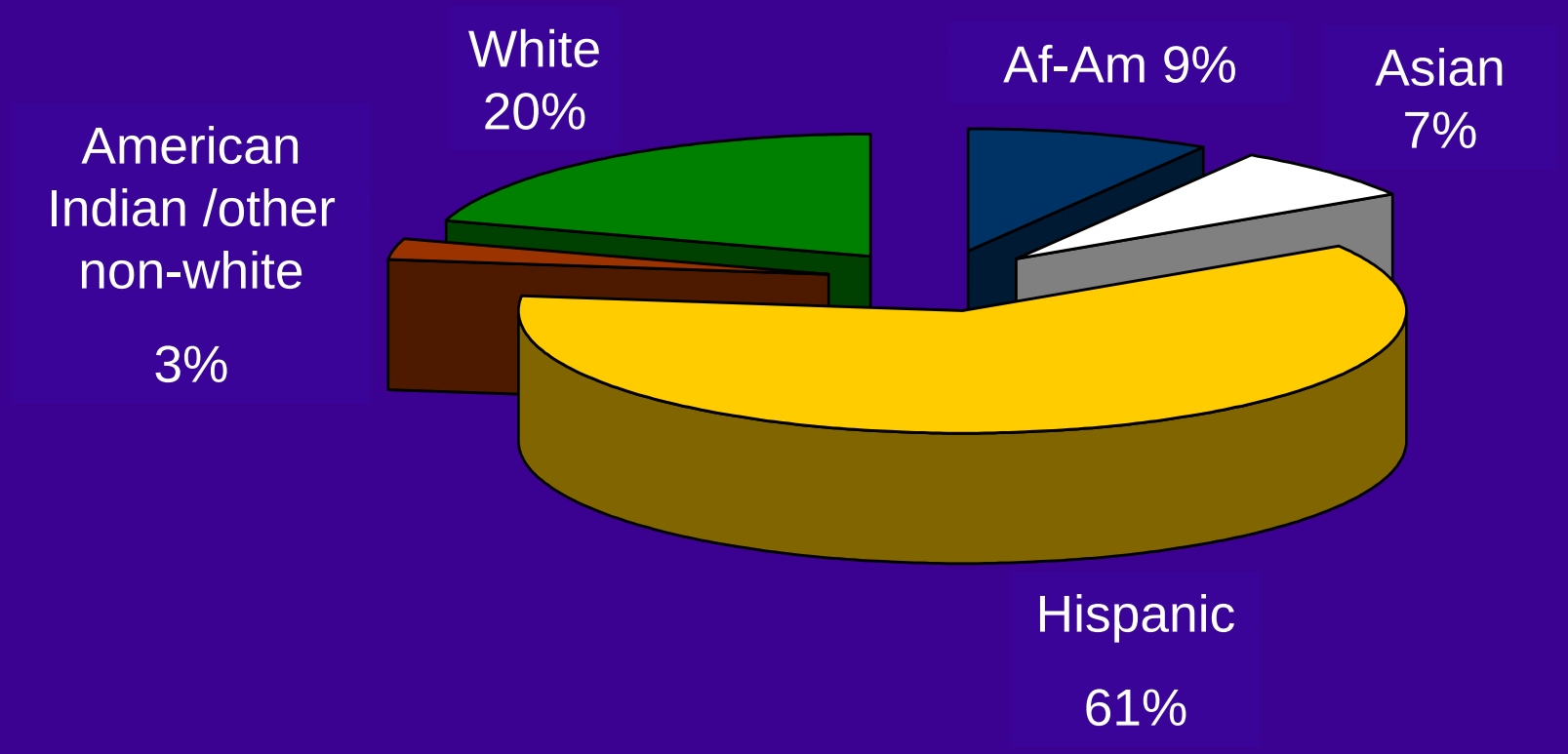


Math class composition: the lower end

Math 105: Arithmetic for College students

Class composition by ethnicity

Fall 2000

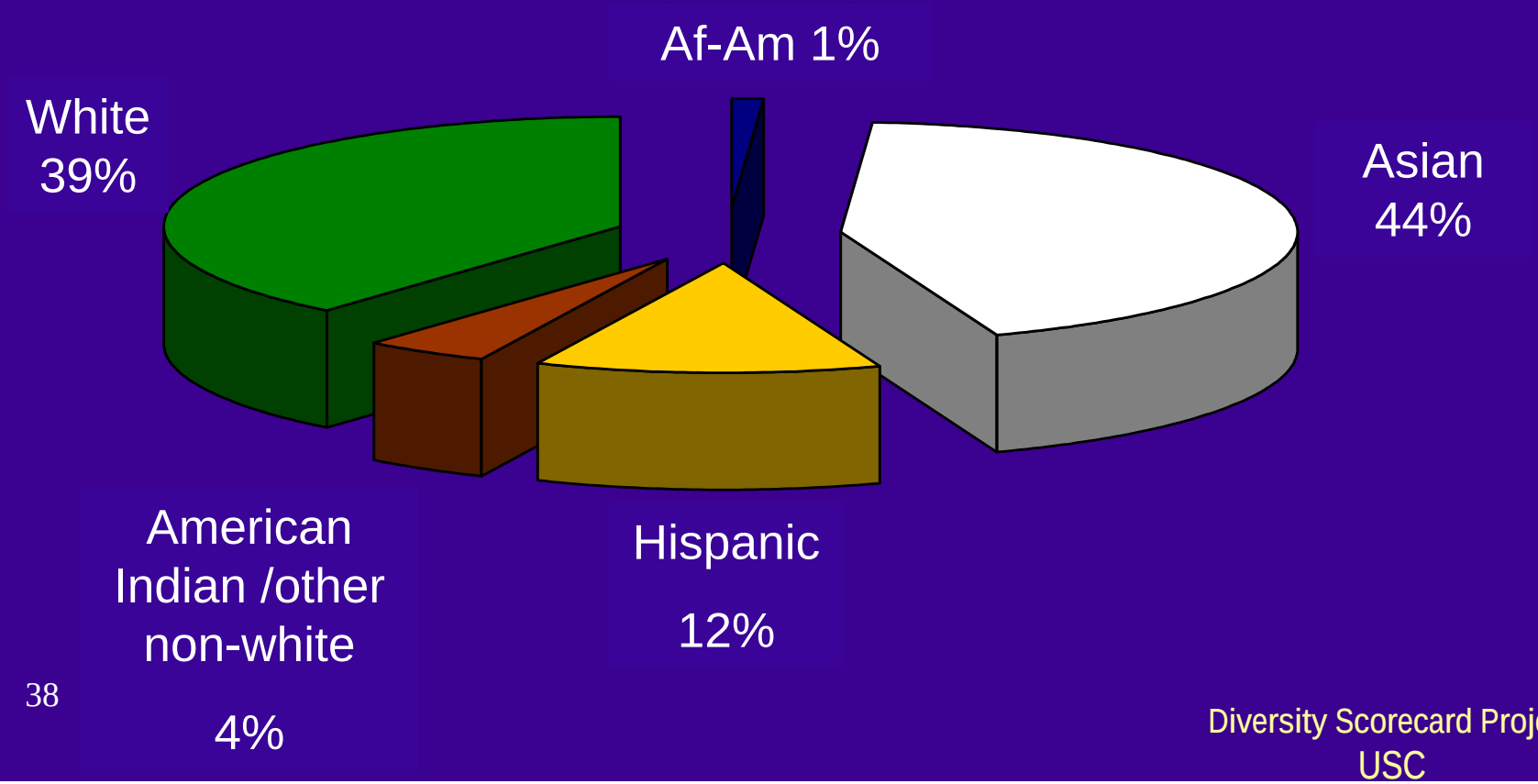


Math class composition: the other end

Math 265: Calculus with Analytic Geometry I

Class composition by ethnicity

Fall 2000



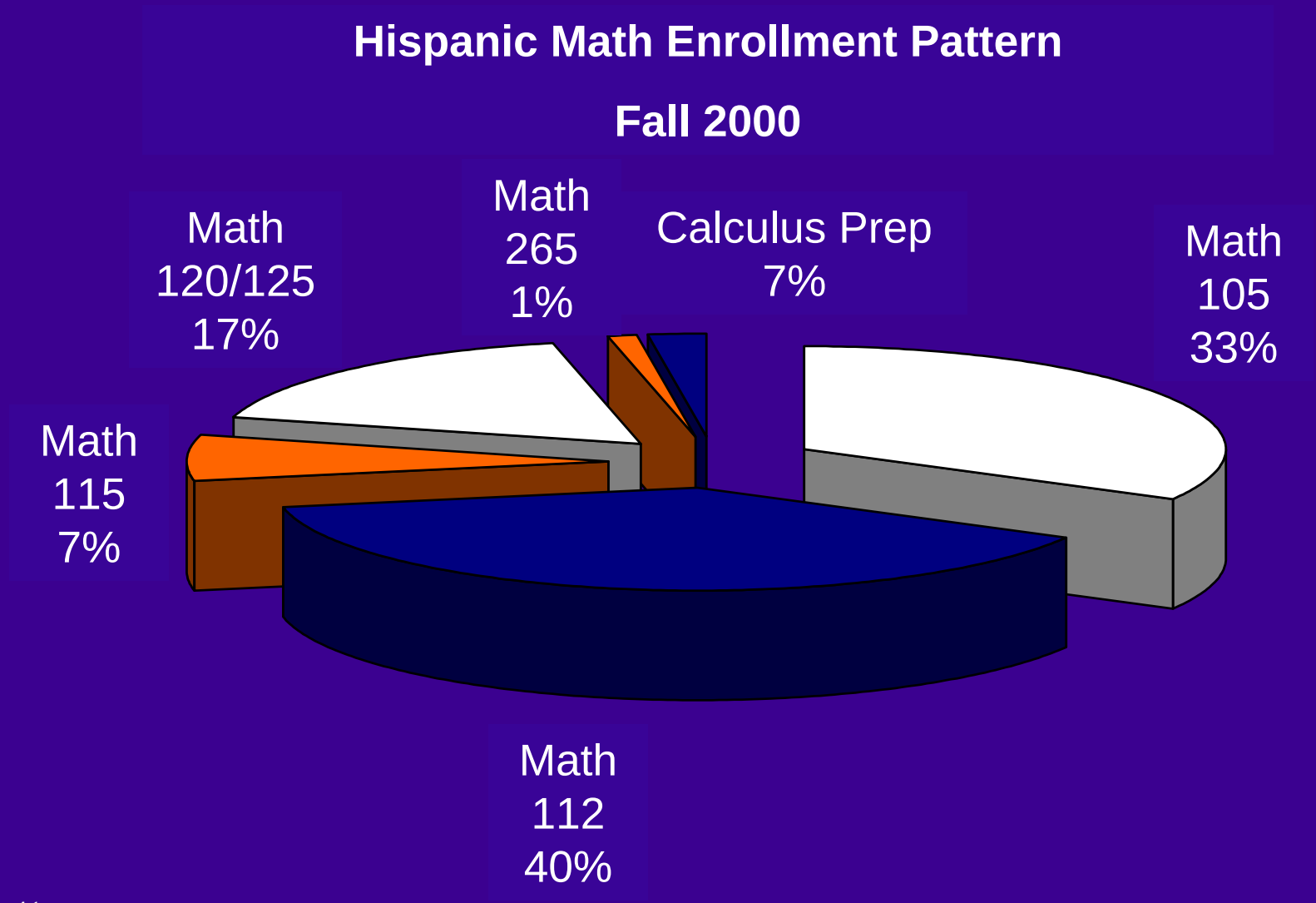
Hispanic Equity Index in Math Enrollment

- Hispanic students make up 46% among the total math enrollment.
- Math 105: 61% / 46% = 1.326
- Math 265: 12% / 46% = 0.261

What if we look at the same issue from another angle?

-- Calculating rate percentages

An example: placement result



Compare to the best performing group…

	Hispanic	The Best Performing Group
Math 105	33%	15%
Math 112	40%	23%
Math 115	7%	9%
Math 120/125	17%	30%
Math 265	1%	16%
Calculus Prep	2%	7%
Total	100%	100%

No easy answer

- What is the purpose of the data analysis?
- Which method to choose?
- Why? – It is important to explain the rational.

The Disadvantages

- Not transparent
- Not complex enough
- Not as equally useful when using rate percentages
- Sometimes masks progress

The Advantages: the Academic Equity Index

- Quantification of the equity gap
- Being straightforward and simple
- The change of the reference population
- Can be used to analyze longitudinal data
- Can also be applied to analyze different levels of data

The Advantages: Equity Benchmarking

- Equity rationale: proportionality
- Using the data that we already have: economical
- Moral imperative

Thank you!

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