



Long-term Outcomes of a Dental Post-baccalaureate Program

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In 1998, ucsf was approached by the med school at Davis because they were seeking funding from a foundation. The head of the foundation was a dentist who raised the question of dental manpower. In order to increase their chance for funding, they asked us if we would like to be part of the grant. We said yes and got the money so late that we either had to do a year of planning or start with a pilot group and we choose the later.

The 2001 class entered dental school in 02 and completed dental school in 06

Background

- U.S. dental schools continue to seek ways to increase the enrollment of students from economically disadvantaged and underrepresented minorities (URM) -- African-Americans, Hispanics, and Native Americans.
- In 2000, in the Pipeline, Profession, and Practice Community-based Dental Program (Pipeline Program) was launched at 15 U.S. dental schools.
- Post-baccalaureate programs are one tool that Pipeline schools have widely implemented to increase enrollment of economically and/or educationally disadvantaged students, including URMs.

Pipeline goals: to increase enrollment of URM students in dental schools and to increase exposure of dental student to community-based dentistry

Pipeline Evaluation

- At Pipeline schools, applications by URM students increased by 77%, enrollments increased by 27% between 2003-2007, and no differences were found between stated practice plans for graduates of Pipeline and non-Pipeline schools.
- Extensive & valuable Pipeline evaluation literature:
Journal of Dental Education 2009;73(2 Suppl)
Journal of Dental Education 2010;74(10 Suppl)
- Pipeline Program evaluation did not track graduates into practice location or type.

Brunson WD, Jackson DL, Sinkford JC, Valachovic RW. Components of effective outreach and recruitment programs for underrepresented minority and low-income dental students. *Journal of dental education* 2010;74(10 Suppl):S74-86.

Formicola AJ, D'Abreu KC, Tedesco LA. Underrepresented minority dental student recruitment and enrollment programs: an overview from the dental Pipeline program. *Journal of dental education* 2010;74(10 Suppl):S67-73.

Andersen RM, Friedman JA, Carreon DC, Bai J, Nakazono TT, Afifi A, et al. Recruitment and retention of underrepresented minority and low-income dental students: effects of the Pipeline program. *Journal of dental education* 2009;73(2 Suppl):S238-58, S375.

Kuthy RA, Woolfolk M, Bailit HL, Formicola AJ, D'Abreu KC. Assessment of the Dental Pipeline program from the external reviewers and National Program Office. *Journal of dental education* 2009;73(2 Suppl):S331; discussion S31-9.

Carreon DC, Davidson PL, Andersen RM. The evaluation framework for the Dental Pipeline program with literature review. *Journal of dental education* 2009;73(2 Suppl):S23-36.

Davidson PL, Nakazono TT, Carreon DC, Bai J, Afifi A. Practice plans of dental school graduating seniors: effects of the Pipeline program. *Journal of dental education* 2009;73(2 Suppl):S283-96.

Post-baccalaureate evaluation

- The literature on post-baccalaureate programs assesses outcomes primarily in terms of the number of students who gain admission to advanced degree programs.
- Some medical post-baccalaureate programs have tracked their participants practice patterns; however, this paper is first to evaluate long-term practice outcomes from a *dental* post-baccalaureate program.

Which are the Post-bac Program's goals.

Post-bac Program overview

- The Dental Post-baccalaureate Program (Post-bac) was established in 1998 at UCSF and is a year-long, full-time program providing re-application assistance to a cohort of 15 students per year, with the goals to:
 - Improve access to dental services for underserved populations in California through the admission of students with expressed and demonstrated interest in caring for the underserved.
 - Increase diversity in the dental school student population by assisting a group of students, whose backgrounds demonstrate significant disadvantage in educational opportunities and/or economic status, to achieve admission to dental school.

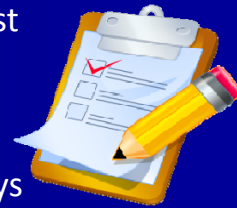
Study outcome measures

- Short-term measures:
 - improvement in DAT scores,
 - acceptance to dental school, and
 - impact on the diversity of the dental school class.
- Mid-term measures:
 - graduation from U.S. dental schools,
 - board pass rates, and
 - entry into practice.
- Long-term measures:
 - current dental practice pattern,
 - patients demographics, and
 - volunteer or outreach work since dental school.

Spend some time

Data sources

- Participants' pre/post DAT scores, dental school admission results, and some demographic data were collected from the Program (1998-2006, n=94).
- A survey was conducted between 2009-2011 with participants who would have been in practice for at least two years post dental-school graduation (n=60), with a response rate of 93% (n=53).
- Nationally available data from the U.S. Census Bureau and from published surveys conducted by the ADA and ADEA.



The survey was conducted between 2009-2011 and collected information about the students' demographics, experiences in dental school, and current practice characteristics. Of the 60 eligible participants, 59 could be located, and 57 (97%) had completed dental school and were included in our survey sample. The survey response rate was 93% (n=53).

Methods

- DAT improvement outcome was analyzed using a pre/post design of paired t-tests and Wilcoxon signed rank tests to assess changes in numeric DAT scores. Mean change score and 95% confidence intervals were estimated.
- Other short-, mid-, and long-term outcomes were analyzed using descriptive statistics to summarize the results of the data collected from the Program and by the survey. The results were compared to U.S. Census data and published data from ADA and ADEA.

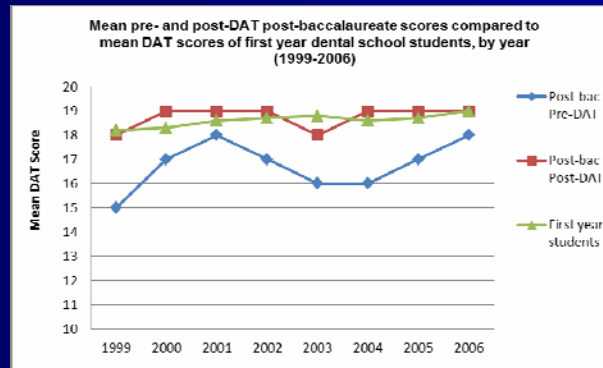
Due to the small census size of the survey, tests of statistical significance would not be valid.

Findings: Short-term outcomes



Change in DAT score

- Participants' mean academic average on the DAT increased 1.9 points (95% confidence interval: 1.6-2.2)



Seven participants had a DAT score of 16 or higher upon entry and so did not need to retake the exam.

Dental school admission

- 98% of participants were accepted into dental school within one year of program completion (n=92).
- The remaining 2 participants were accepted the following year.
- Subsequently, 100% of Post-bac participants were accepted to dental school.

Gender diversity

Distribution of Post-baccalaureate participants gender compared to ADA 2007 dental enrollment data

Gender	Percent of Post-bac participants	Distribution of all dental school enrollees
Female	55% (n=52)	43% (n=2051)
Male	45% (n=42)	57% (n=2719)
Total Participants	100% (n=94)	100% (n=4770)

Additionally, from the survey, we know that 55% of our respondents are female, compared to 43% of the 2007 dental school enrollees. This is with a 93% response rate.

Racial/ethnic diversity

Distribution of race/ethnicity of Post-baccalaureate students by admission to dental school, compared to ADA 2007 dental enrollment data

Race/Ethnicity	Post-bacs admitted to dental school (%)	All dental school enrollees (%)
African American	9% (n=8)	6% (n=286)
Hispanic/Latina(o)	24% (n=23)	7% (n=334)
Native American	4% (n=4)	0.6% (n=29)
Total URM (African Americans, Hispanic, or Native Americans)	37% (n=35)	13.6% (n=649)
Asian/Pacific Islander	33 % (n=30)	20% (n=954)
Caucasian	30% (n=27)	62.5% (n=2981)
Other	n/a	3.9% (n=186)
Total Participants	100% (n=92)	100% (n=4770)

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Parents' educational achievement

Comparison of highest level of parents' educational achievement for Post-bac respondents (n=53) and 2008 dental school graduating seniors (n not given)*

Educational achievement	Mother's highest education		Father's highest education	
	Post-bac	ADEA	Post-bac	ADEA
Did not graduate H.S.	30%	5%	26%	5%
H.S. graduate	30%	16%	19%	11%
Some college	15%	5%	24.5%	5%
Four-year degree	13%	49%	22%	34%
Graduate school	11%	24%	7.5%	44%
Total	100%	99%	100%	99%

**Categories do not match exactly. (Source: Annual ADEA's Survey of Dental School Seniors: 2008 Graduating Class)*

60% of Post-baccalaureate graduates' mothers' and 45% of the graduates' fathers' highest level of education achieved was at or below a high school diploma. In comparison to all grads in the ADEA data, 73% of the graduates mothers had completed some college or higher as had 78% of fathers.

Post-bac's have much lower parental educational achievement than do their counterparts in the ADEA survey.

Findings: Mid-term outcomes



Dental school graduation, Board pass rate & current practice

- **Graduation:** 97% (n=57) of the 59 located Post-bacs graduated dental school, compared to 95.4% of all enrollees in the Class of 2007.
- **Board pass rate:** 100% of Post-bac respondents passed their national board exams, compared to 99.4% of all graduates passing boards in the Class of 2007.
- **Current practice:** At the time of the survey, 100% of the respondents were practicing dentistry.



A first round of the survey was conducted in 2009 on the first four cohorts, the last of whom finished the Post-bac in 2002, graduated dental school in 2007, and had been in practice for two years in 2009.

- 47% (n=25) of the graduates attended UCSF.
- 19% (n=10) attended University of the Pacific.
- The remaining 34% (n=18) graduates attended 11 institutions in nine different states.

Findings: Long-term outcomes



ZIP code analysis of practice location using Census data

- 83% of Post-bac respondents report that they are working with an underserved population.

ZIP code analysis of Post-bacs' practice locations compared to indicators of diversity/disadvantage, using U.S. Census data

	Mean Post-bacs practice location (Range)	Mean percent of U.S. population
Living under FPL	11.5% (1-47%)	13.8%
Hispanic/Latina(o)	25.2% (2-91%)	16.3%
Do not speak English at home	34.2% (3-91%)	20.1%

Composition of Post-bac's payer types in current practice

Comparison of Post-bac respondents' and New Independent Dentists' (ADA 2008) mean distribution of payer type		
Payer type	Post-bacs' (n=45)	New Independent Dentists' mean percent
Private insurance	45%	63%
Medicaid	31%	9%
Self-pay	15%	28%
Reduced fee	9%	n/a

Eight survey respondents did not report the composition of their payer types. Of those who did, 52% of the PB grads treat Medicaid patients. On average, 56% of their patients are covered by Medicaid.

Race/ethnicity of Post-bac's patients

Comparison of average composition of Post-bac respondents' patients' race / ethnicity (n=53) to U.S. population		
Race / ethnicity	Mean Post-Bac %	Mean U.S. %*
White	31%	64%
Asian	14%	5%
Middle Eastern	2%	n/a
Hispanic/Latina(o)	38%	16%
African American	10%	13%
Native American	5%	.9%
Total URM	53%	30%
Total	100%	100%

*Categories do not match exactly.

We have no comparable data for the general population of dentists.

Hispanic/Latina(o) patients represent the largest share of the grads' practices on average. Approximately half (n=29) of the Post-baccalaureate graduates speak a language other than English with their patients. Spanish is spoken by 88% (n=21) of the 24 who reported the specific language. The range of languages spoken by other graduates includes Tagalog, Arabic, Farsi, and Hebrew.

Racial/ethnic concordance among Post-bacs and patients

Mean composition of dentist's practice by race / ethnicity of dentist and patients (n=52)

Dentist's race / ethnicity	Patients' race / ethnicity							
	African American	Caucasian	Chinese	Filipino	Hispanic/Latina(o)	Middle Eastern	Native American	SE Asian
African American	25%	16	2	1	43	1	5	4
Caucasian	6	48%	2	1	37	1	0	3
Chinese	9	25	8%	1	47	1	0	0
Filipino	5	8	5	38%	41	0	3	4
Hispanic/Latina(o)	6	33	2	1	51%	1	1	1
Middle Eastern	15	31	4	3	34	7%	1	1
Native American	2	27	0	0	3	0	67%	0
SE Asian	13	8	3	5	48	3	0	15%

Percent of patients does not total to 100% as dentists treat additional patients of races and ethnicities not shown here.

For example, although African American dentists treat more Hispanic patients (43%) than they do African American patients (25%), no other race or ethnicity of dentist treats more African American patients than do African American dentists.

Examining Caucasian dentists, we see that Caucasian patients comprise, on average, 48% of their practices, which is a greater percent than that any other race or ethnicity of dentist.

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Outreach activities after dental school

- Since the completion of dental school:
 - 83% of Post-bac respondents report performing outreach activities to minority or disadvantaged students, and
 - 83% report being involved in mentoring students who are interested in the health professions.
- Respondents who reported being “involved” or “very involved” with their activities also reported being “satisfied” or “very satisfied” with those activities.

Higher involvement with these activities corresponded to higher satisfaction with these activities.

Conclusions

- The short-, mid-term outcomes show that the Program has been successful in increasing diversity in dental schools.
- The long-term measures indicate that Post-bac participants are improving access to care for diverse populations.
- The Post-bac Program sends fewer than 20 students to dental school every year in a pool of more than 5000 entrants, meaning that while important, the impact of the Program on the dental profession overall is small.

Limitations

- Due to the small census size of the study, tests of statistical significance would be invalid.
- The study lacks a controlled comparison group.
- It is very difficult, if not impossible, to determine the degree of influence of this Post-bac Program versus school choice, life experience, or other practice incentives.
- The study results indicate enough difference between the Post-bacs and the general dentist population to merit further research.

Funding & acknowledgements

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Acknowledgments: The authors would like to acknowledge past officials from the post-baccalaureate program, Dr Barry Rothman, and post-baccalaureate program participants who contributed to this research: Jolie Goodman, Ryan Dela Cruz, Rubin Espinosa.

THANK YOU!

Background

- Dental educators recognize the importance of a diverse student body in increasing the cultural competence of health care practitioners and in increasing access to care for the underserved;
- Yet, African-Americans, Hispanics, and Native Americans remain underrepresented minorities (URM) in dental professions compared to their distribution in the general U.S. population;
- In 2000, in the Pipeline, Profession, and Practice Community-based Dental Program (Pipeline Program) was launched at 15 US dental schools to increase enrollment of URM students and to better prepare dental student to treat a diverse patient population.

Academic profile of entering students

	<u>Average</u>	<u>Range</u>
Total GPA	3.0	2.5-3.6
Science GPA	2.8	2.5-3.2
DAT Scores		
Academic Average	17	13-21

IT HAS BEEN INTERESTING TO DETERMINE THE CUTTOFF CRITERIA. IT IS EVIDENT THAT AS YOU ACCEPT A LOWER GRADE POINT, YOU WILL INCREASE THE NUMBER OF URM STUDENTS.

HOW FAR ONE CAN GO WITH THE FOLLOWING ARGUMENT TO AN ADMISSION COMMITTEE...

LOOK AT WHAT A FANTASTIC PERSON THIS INDIVIDUAL IS AND LOOK AT WHAT THIS STUDENT HAS DONE THE PAST YEARIGNORE HIS/HER GPA.

THIS GOES BEYOND THE MINIMUM GPA PRINTED IN A SCHOOLS MATERIALS. THERE ARE ALWAYS GOING TO BE EXCEPTIONS.

CHARLES AND I HAD TO BALANCE OUR BELIEF THAT THESE STUDENTS COULD DO IT WITH THE REALITY THAT IT WAS THE ADMISSION COMMITTEE THAT WAS GOING TO MAKE THE DECISION. THERE HAD TO BE BUY IN BY THE ADMISSION COMMITTEE.

IT IS HARDER TO CHANGE THE GPA THAN THE DAT SCORES.

Pre-dental school enrichment

“The bedrock of the Pipeline Program”

- Summer enrichment and post-baccalaureate programs have been widely implemented at dental schools to increase enrollment of URM students.
- 60% of Pipeline Program schools have a formal post-baccalaureate program.
- These programs are generally short-term programs intended to provide dental school re-application assistance to students from economically disadvantaged or racially or ethnically diverse backgrounds by:
 - improving study skills,
 - improving DAT or MCAT performance, and
 - providing additional exposure to the dental or medical professions

Brunson, et al., 2010 - Components of effective outreach and recruitment programs for underrepresented minority and low-income dental students

Brunson WD, Jackson DL, Sinkford JC, Valachovic RW. Components of effective outreach and recruitment programs for underrepresented minority and low-income dental students. *Journal of dental education* 2010;74(10 Suppl):S74-86.

Post-bac Program admission criteria

- Have an overall GPA of at least 2.6 and a science GPA of at least 2.4 on a 4.0 scale;
- Have documented evidence of being academically or economically disadvantaged;
- Possess a demonstrated interest in and desire to work with underserved communities or in communities with limited access to dental health care;

- A disadvantaged individual is defined as one who, from an early age, resided in a low-income community or experienced enduring family, societal, or other hardship that significantly compromised educational opportunities. Race and ethnicity, while correlates of disadvantage, are not considered in the selection of applicants in accordance with California State Proposition 209
- underserved is defined by HRSA shortage area - HPSA