

A Model of Dental Public Health Teaching at the Undergraduate Level in Peru

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Abstract: There has been a growing interest among dental educators regarding the opportunities offered by community-based dental education as a means to allow dental students to assume their role as health professionals in the real world. Although several dental schools have integrated community-based education into their curricula, most have not engaged their students in the development of competencies to address dental health needs at the community level. The purpose of this article is to discuss the teaching-learning experiences in dental public health at the undergraduate level in the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia (FS-UPCH) in Lima, Peru. The teaching-learning activities in dental public health at the FS-UPCH consist of two well-defined stages: experiences in low-income urban communities and experiences in low-income rural communities. Both stages have been designed to make it possible for students to acquire competency in addressing oral health needs at the community level as well as to enlarge and deepen their knowledge about the social and health situation in Peru. In community-based dental education, students are not only placed in community settings to treat individual patients, but also challenged to consider dental public health issues, including the administrative aspects of dental services.

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The December 1999 issue of the *Journal of Dental Education* was entirely devoted to community-based learning and aspects surrounding this educational methodology. An analysis of financial and legal viewpoints as well as the design, feasibility, and management of this educational methodology was presented. Since then, this journal has published additional reports on community-based dental programs.^{1,2} However, there is a lack of published information regarding community-based dental education programs outside North America.

A community is a group of individuals living in a determined environment and sharing a specific culture. It should be the start and an endpoint of the university's commitment.^{3,4} Since its creation in 1969, the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia (FS-UPCH) has based its teaching-learning experiences on a unitary and integral concept of the university mission.⁴ This concept implies that any university has three principal activities: teaching, research, and service to the community.^{3,4}

The FS-UPCH recognizes that the community's oral health needs are the axis of its academic organization. This is primarily for two reasons. First, the

community is the place where oral health problems occur, and thus, it is also where these problems need to be solved. A primary mission of the FS-UPCH is to provide the community with appropriately trained personnel to detect oral health problems and also to create and implement strategies to resolve these problems.^{4,5} Second, the university has to contribute to testing the efficacy, efficiency, and effectiveness of different alternatives to solve community health problems.⁴ In that sense, it is the responsibility of the university to prioritize the problems affecting populations in need.⁵ Based on these viewpoints, the FS-UPCH faculty team developed and implemented a curriculum based on dental functions,^{4,6-8} with the primary goal of producing professionals who are conscious of the health conditions of our nation.⁵

In the FS-UPCH, the professional profile is made up of competencies identified by means of a two-way matrix that crosses six dental needs with six kinds of dental care required to address those needs (Figure 1).^{4,9,10} In this matrix, each column and each row represent a competency. For example, performing an integrated treatment to address dental tissue diseases is considered a competency, as is developing an integrated diagnosis of the oral health

Dental Care Health Needs	Diagnosis and Treatment Planning	Health Promotion	Prevention of Disease	Recovering a Healthy Status	Rehabilitation of Form and Function	Administration
Diseases and conditions of the dental tissues						
Diseases and conditions of the periodontal tissues						
Variations in occlusion						
Other conditions in the maxillofacial region						
Systemic diseases						
Needs assessed at the community level	DENTAL PUBLIC HEALTH COMPETENCY					

Figure 1. Curricular matrix of the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia

needs. Consequently, there are twelve competencies represented in this matrix. The process for identifying these competencies and creating a curriculum has previously been described.^{9,10}

Dental public health is the social service of preventing and controlling dental diseases and promoting dental health through organized community efforts.^{4,11} It is that part of dental practice concerned with the dental health education of the public, with applied dental research, and with the administration of group dental care programs as well as the preven-

tion and control of dental diseases at the community level.¹¹ In the proposed educational model, dental public health competency is one of the above mentioned twelve competencies targeted to solving oral health needs in the community.^{4,9,10}

The purpose of this article is to discuss the teaching-learning experiences in dental public health at the undergraduate level in the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia in Lima, Peru.

Program Description

Just like any other competency in the curricular matrix of the FS-UPCH, the dental public health competency requires that students perform a certain number of activities, which are referred to as basic functions.^{6,7,9,10,12} At the undergraduate level, students are required to learn to perform twenty-one different basic functions in dental public health (Figure 2), identified by means of function and task analyses performed by the faculty team who developed and implemented the dental curriculum for the FS-UPCH in the early 1970s.^{3,4,7,12} These teaching-learning experiences are organized into a sequence of six courses in our curriculum (Figure 3).

The Social Dentistry Department at the FS-UPCH is responsible for teaching public health and community dentistry. This academic department is the center for the planning, organization, implementation, and evaluation of the work performed in, with, and for the community.^{3,5} Teaching-learning activities of the Social Dentistry Department are made up of two well-defined stages: experiences in low-income urban communities and experiences in low-income rural communities.^{3,5,13,14} Both stages have been part

of the teaching-learning experiences performed at the FS-UPCH since it was founded in 1969.

Experiences in Low-Income Urban Communities

During this first stage, students have an educational experience working for a low-income urban community. In order to produce a fruitful learning experience, the low-income urban community is chosen by using the following criteria: 1) its location within the university's influence area (north zone of Lima, capital of Peru), 2) the distance between the community and the university (no more than one hour on public transportation), 3) its population size in relation to the number of students, 4) its level of internal community organization, 5) the safety conditions in the community, 6) its commitment and predisposition to work together with the university, and 7) the distance between the community and the nearest dental care service.^{3,5}

This first stage is a part of five academic semesters, distributed from the second to the fourth academic year (Figure 3). In Peru, the overall dental school curriculum includes ten academic semesters (each of eighteen weeks in duration) over five cal-

Basic Function	Item
1	To elaborate the socioeconomic-cultural diagnosis of a community
2	To elaborate the health diagnosis of a community
3	To elaborate the oral health diagnosis of a community
4	To develop activities to promote community development
5	To promote health and oral health through health education
6	To promote health and oral health through training of community agents
7	To promote health and oral health through creation of healthy settings
8	To design, develop, and evaluate community preventive interventions
9	To design, develop, and evaluate community restorative interventions
10	To apply basic maintenance to dental equipment and instruments
11	To plan and program delivery of oral health services at the community level
12	To manage health care systems in groups
13	To manage dental practice in public and private areas
14	To integrate into the public health system
15	To use appropriate technology and ergonomics in dental practice
16	To adapt dental practice to existing laws and regulations
17	To participate in an epidemiological surveillance system
18	To adapt dental practice to situations that limit it
19	To interact with other health professionals for satisfying community health needs
20	To contribute to the production and dissemination of scientific knowledge
21	To incorporate dental practice into your personal and community development

Figure 2. Functions included in dental public health competency of the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia

Academic Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
First Year												
Second Year										Social Dentistry I		
Third Year			Social Dentistry II						Social Dentistry III			
Fourth Year			Social Dentistry IV						Social Dentistry V			
Fifth Year	Rural Internship*			Rural Internship*			Rural Internship*					

*Each class is divided into three groups of students to rotate through the rural internship at different times of the academic year.

Figure 3. Distribution of dental public health courses in the competency-based curriculum of the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia

endar years. In FS-UPCH, each of the five semesters includes a course in dental public health, requiring a weekly dedication of three to six hours for fieldwork and one to two hours for theoretical lectures. Students perform their fieldwork together in groups of four to six members. The main content of each course in dental public health is summarized in Figure 4.

During the first course, students prepare a socioeconomic-cultural and general health diagnosis of the assigned community by using systematic observations and face-to-face structured interviews for data collection.^{3,5} The participation of the population in these activities is guaranteed by the support of the formal and informal leaders of the community.

In the second course, the students generate epidemiological findings concerning community-wide oral health problems, which includes dental and periodontal diseases, soft tissue lesions, and oral hygiene conditions as well as knowledge, behaviors, and attitudes about oral health. In some cases, sampling techniques are used, especially in densely populated communities. Previous to the clinical examinations, students are appropriately trained and calibrated to obtain acceptable reliability levels for the data collection.¹⁵ As with the first course, student activities are conducted through home visits, a procedure that strengthens interaction with the population.^{3,5}

During the third, fourth, and fifth courses (Figures 3 and 4), students plan, implement, and evaluate

a community-based intervention in facilities provided by the community such as a local government meeting place, a leader's house, or a local schoolroom. In these experiences the student practices with simplified dental equipment provided by the FS-UPCH.³ Prior to direct clinical activities, the results of the socioeconomic-cultural and oral health diagnoses are discussed with the community in order to design a preventive-promotional intervention in general and oral health, which is expected to be sponsored by the community. The intervention includes activities related to the creation of healthy settings, community development, health and oral health education, and use of topically administered fluoride and tooth extractions, among others. The referral of complex cases either to the public health services or to the dental clinic of the FS-UPCH is encouraged.

In recent years, the application of pit-and-fissure sealants and fillings employing the atraumatic restorative treatment (ART) technique have been included as part of the activities carried out by the students during the fourth course.¹⁶ During this course, a second evaluation of the oral health condition is conducted to obtain data about oral health surveillance performed by the students at the time of the preventive-promotional intervention.

Finally, during the fifth course, students and community try different modalities to ensure the long-term self-sustenance of the intervention; for

Social Dentistry I	Social Dentistry II	Social Dentistry III	Social Dentistry IV	Social Dentistry V
Elaboration of a socioeconomic and cultural diagnosis	Generation of epidemiological findings about community-wide oral health needs	Planning, development, and evaluation of preventive-promotional community-based interventions in general health and oral health		
Elaboration of a general health appraisal				
	Elaboration and participation in a local surveillance system in oral health			

Figure 4. Description of the core of each course in dental public health of the Faculty of Stomatology at the Universidad Peruana Cayetano Heredia

this purpose, the intervention includes the training of community health workers who serve voluntarily in the community.^{3,5} At the same time, students disseminate among the community, professors, and fellow students the analysis and interpretation of the data collected from their oral health surveillance and the results of their two-and-half-year intervention.

Posters and oral presentations for scientific meetings are prepared to disseminate the results obtained. In addition, outstanding works are submitted to national medical and dental journals.¹⁶⁻²² Social Dentistry Department faculty supervise the preparation of these materials.

In most cases, when a new class begins, students are assigned to a newly settled population in the surroundings of the low-income urban community where previous classes performed their interventions. It is expected that each new class takes care of the newly assigned community and simultaneously maintains the interventions carried out in the previous communities. This progressive community approach makes it possible for the university to increase and sustain the intervention in the covered population.

Experiences in Low-Income Rural Communities

The rural experience is the second stage of working for the community. During this advanced

stage, known as the rural internship, senior (fifth-year) students spend four months living in rural communities located in Peruvian highland or jungle towns. Each student is assigned to a community. A full-time dedication provides a more intense and sustained experience than in the first stage in low-income urban communities.

Similar to the urban experience, rural communities are carefully selected. Criteria include 1) their location out of the city of Lima, where the FS-UPCH is based; 2) their number of inhabitants; 3) the safety conditions in the community; 4) the disposition and commitment of the community to participate in the experience, especially in relation to providing lodging and food for the assigned student; 5) the existence of health care services operated by the Ministry of Health that have a dentist on its staff; and 6) the existence of a formal agreement between the FS-UPCH and the regional director of the Ministry of Health.

During the fifth year of dental school, each class is divided into three groups of students. While one group participates in the rural internship, the other two groups are assigned to rotation internships in the FS-UPCH dental clinical and the associated university hospital. As a result, the three groups of students rotate through the rural internship throughout the whole year. This arrangement ensures the continuity of dental services for a given rural community.^{3,5,13}

The rural internship is made up of three consecutive units. During the first unit (of one week duration), called the preinternship seminar, students are informed about the most frequent pathologies in the assigned communities, taking into consideration that they will be expected to work inside and outside of the health service facilities and to follow the regulations of both the university and the Ministry of Health.¹³ Students are also provided an update on dental public health needs, issues, and techniques.

The second unit is fourteen weeks long. During this time each student lives full-time in his or her respective rural community. Students are accompanied to and accommodated in the community by a faculty of the Social Dentistry Department, who is responsible for ensuring the best available living conditions. Thereafter, students are expected to carry out activities similar to those performed previously in urban communities with the following differences: 1) students work by themselves and devote full-time to the community since they are not involved in any simultaneous academic course, and 2) students receive periodic supervision by FS-UPCH faculty (every five weeks) for orientation, supervision, and evaluation.^{13,14} For the bulk of the fourteen weeks, the health service's dentist acts as an on-site tutor.^{3,5,13,14}

Students are expected to divide their time equally between fieldwork, especially preventive-promotional activities (i.e., extramural activities), and the provision of patient care in the health center facilities (i.e., intramural activities). Each student must design, develop, and evaluate two different plans: a support plan for those oral and general health activities belonging to the health service routine, and a parallel field plan for those activities directed to diagnose and meet the oral health needs of a specific community located within the scope of his or her health service unit.

In his or her support plan, the student is also asked to perform activities with other members of the health team (physicians, nurses, and midwives). For this purpose, the student travels to the nearby communities in his or her program of activities. Thanks to this scheme each student participates in multidisciplinary experiences, thereby contributing to the general health care activities with other health professionals. Concurrently, in their field plan, students are expected to carry out activities similar to those developed in the first stage.^{3,5,13,14} The community-based intervention is directed to vulnerable groups such as pregnant women, children, and adolescents. Administrative as well as management tasks are also

performed by students in order to obtain financial support for their activities, allocate resources for their intervention, and carry out scheduled activities of the Ministry of Health program.

The third unit—the post-internship seminar—is conducted in the university during the last week of the rotation after students have returned from their assigned rural communities. In this unit, students report, analyze, and evaluate their respective extramural and intramural rural activities. Furthermore, the students that have just completed their rural internship share information with the next group of students who have been assigned to the same rural communities, thus promoting long-term maintenance of the dental services.

It should be understood that the first and second stages for the dental public health experience have their own objectives, even though most of the dental care functions are the same but performed in different settings and under different demographic, organizational, and cultural conditions. Each stage provides students with training experiences that have unique advantages and are complementary. The experiences in the low-income rural communities have two educational benefits for the students: 1) the rural internship is a more advanced stage of the community work, representing a preprofessional practice with little supervision, and 2) during this stage, dental students benefit from working closely in association with other health care professionals.

As far as the FS-UPCH students' characteristics, each class is made up of students sixteen to twenty-two years old and most are females (2.5 to 1). Most of the students come from middle-income urban areas, especially from Lima, the capital of Peru. The courses in dental public health allow the students to understand the living conditions in low-income communities, where there are diverse health care needs. The responsibility of carrying out a community-based intervention by themselves and at the same time experiencing cultural and emotional adjustment contribute to make the rural internship one of the most enriching experiences of our students' educational process.

Discussion

This report describes the teaching-learning experiences in dental public health performed by the FS-UPCH in Peru. The main objective of these experiences is for the student to become capable in

recognizing the community socioeconomic-cultural conditions, so as to be able to understand the multiple causes and the nature of general and oral health problems, thus surpassing a simple biomedical approach.^{3,5} It is expected that direct interaction with the social condition of the community, especially in low-income communities, will help students to adopt a positive attitude and working abilities that will enable them to introduce organizational and administrative changes to contribute to the solution of community health problems.^{3,5,14}

Over the past thirty-five years, the FS-UPCH has continued to develop its community-based dental education with the purpose of educating dental students in the provision of dental health services to underserved populations. During all this time, the evaluation of both teaching-learning experiences has been performed qualitatively, based on the observation of faculties, students, and community behaviors and appraisals. At the present time, the FS-UPCH recognizes the need for objective quantitative evaluation, which is being conducted.

In relation to the oral health epidemiological changes, a recent report indicates that the intervention performed in seven communities from Sol Naciente (Carabayllo, Lima) was effective in reducing dental caries incidence in children from six to fourteen years old during the eighteen months assessed.²³ The same intervention favorably affected oral health knowledge, attitudes, and behaviors in individuals older than twelve years old, with significant increments after twelve and eighteen months of intervention.^{19,20,24} Also, an improvement in the oral hygiene levels among the participating children was reported.²³

Similarly, early childhood caries in children younger than three years old was prevented through the surveillance system implemented in communities of Sol Naciente. After eighteen months of surveillance, the incidence of dental childhood caries was 0.32 teeth and 0.74 surfaces, which is below the incidence reported in other low-income communities.^{17,25}

As far as the students' perspective, a recent study has reported that our recent graduates perceived themselves as very competent in solving dental health needs at the community level.²⁶ However, an objective evaluation of students' and new graduates' perceptions of the program has not yet been conducted. Further studies are required to assess students' attitudes before, during, and after taking our dental public health courses.

The desirable outcomes obtained for the three parts involved in these experiences (community,

students, and faculty) support the feasibility of integrating the academic activities of teaching, research, and service to the community.

Despite the recognized importance of dental public health for the individual and for the community, this subject is mainly taught at the postgraduate level in master's or doctoral degree programs at many universities around the world, just like other specialties in dentistry. Even though dental schools include public health at the undergraduate level, they do it usually through theoretical courses or, in some cases, through intramural experiences within a public health service. It is recognized that, despite the extent of undergraduate exposure to public health courses,^{3,4,6-10} there are important contents in dental public health that require additional education at the postgraduate level.

There has been a growing interest among dental educators concerning the opportunities offered by community-based dental education as a means to help students assume their role as health professionals in the real world.^{2,27-29} In spite of the fact that the educational value of community-based learning has been advocated repeatedly as one of the areas that should be expanded in the dental school curriculum, the use of community-based dental education is mostly reported only as community-based clinics for students' training related to procedural, in-the-mouth skills.^{27,30-34} In most reports of community-based dental education, the extent of the students' involvement with the community is not clear.

Community-based dental education, as a component of competency-based dental education, is a type of experiential learning conducted in community settings.³⁵ However, this is not simply practicing clinical dentistry at the community setting; rather, through this experience, students should be able to enhance their appreciation and understanding of the larger social, economic, and cultural determinants of dental health care and how such determinants affect the access and delivery of dental care.^{2,35}

Higher education in dentistry must prepare students to be knowledgeable about community health issues with an ethical understanding of service and social responsibility and not just to develop clinical competencies only. In today's evolving social, economic, and health care environment, a traditional curriculum that confines students to lecture halls and clinics is viewed as increasingly inadequate to train competent graduates to appropriately meet the health care needs of the population in the coming decades.²⁹

It is our understanding that although several dental schools have integrated community-based education into their curricula, most of them have not provided students with learning experiences that allow them to develop competencies to address dental health needs at the community level. In addition, community-based dental education provides the students with opportunities to assess and discuss the existing health problems in the community, provided that they are guided through a reflective process.^{3,8,29,35} Fieldwork plus photographic documentation, written narratives, critical incident reports, and mentored post-experience small group discussions could be used to enrich community-based learning experiences.³⁵ The courses taught in the FS-UPCH have included these learning experiences since its foundation.^{3,13,14}

In conclusion, the qualitative assessment of the two stages of teaching-learning experiences in dental public health included in the curricular undergraduate program carried out by FS-UPCH shows that the students reach a good level of proficiency in the management of community oral health problems. From our experience gained through the years, we believe it is clear that community-based dental education should not only consist of deploying students in community settings to treat individual patients, but rather should include learning opportunities that challenge students to value dental public health issues, including the administrative aspects of dental services.

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REFERENCES

1. Ayers CS, Abrams RA, Robinson M. U.S. and Canadian dental school involvement in extramural programming. *J Dent Educ* 2001;65:1272-7.
2. Skelton J, Mullins MR, Kaplan AL, West KP, Smith TA. University of Kentucky community-based field experience: program description. *J Dent Educ* 2001;65:1238-42.
3. Zárate G, Bernal J, Balarezo N, Izquierdo J. La experiencia de la Universidad Peruana Cayetano Heredia en educación odontológica (The experience in dental education of Cayetano Heredia University of Peru). *Educ Med Salud* 1978;12:436-56.
4. Beltrán RJ. Educación en odontología: manual del profesor (Dental education: the teacher manual). Lima: Universidad Peruana Cayetano Heredia, 1998.
5. Mondoñedo J. Experiencias de docencia-servicio comunitaria en la educación odontológica del Departamento de Odontología Social (Community teaching-service experiences in dental education of the Social Dentistry Department). *Rev Estomatol Hered* 1991;1:27-30.
6. Beltrán R. Modelo para el diseño curricular en ciencias de salud (Model for curricular design in the health sciences). *Revista de la Asociación Latinoamericana de Facultades de Odontología ALAFO* 1975;10:95-106.
7. Beltrán R, Bernal J. Aprendizaje por funciones (Learning about functions). *Revista de la Asociación Latinoamericana de Facultades de Odontología ALAFO* 1976;11:6-21.
8. Beltrán R, Gillespie GM. Changing patterns in dental education in Latin America. *Int Dent J* 1977;27:10-7.
9. Beltrán-Neira RJ, Beltrán-Aguilar ED. Taxonomy for competency-based dental curricula. *J Dent Educ* 2004;68:978-84.
10. Beltrán-Neira RJ, Ikeda MC. Taxonomía de competencias en educación odontológica (Taxonomy of competencies in dental education). *Rev Estomatol Hered* 2004;107-11.
11. Silverstein SJ. Pathways in dental public health. *J Calif Dent Assoc* 2005;33:541-3.
12. Beltrán R, Aguayo H, Donayre F. Una función: un módulo (A function: a model). *Revista de la Asociación Latinoamericana de Facultades de Odontología ALAFO* 1979;14:41-52.
13. Rivera R, Bernal J, Beltrán R. Internado rural estomatológico (Rural internship in Stomatology). *Innovaciones II* 1983:10-4.
14. Izquierdo J, Beltrán R, Rivera R, Villar E, Velásquez C. Internado rural multidisciplinario en el Perú (Multidisciplinary rural internship in Peru). *Revista de la Red para el Desarrollo y la Acción Intersectorial REDES* 1987:14-8.
15. Oral health surveys: basic methods. Geneva: World Health Organization, 1997.
16. Delgado E, Asián D, Paredes E, Sánchez P. Supervivencia de sellantes y restauraciones ART en molares permanentes de niños residentes en Sol Naciente-Carabayllo (Surveillance of sealants and restorations with ART technique in permanent molars of children from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:46.
17. Bernabé E, Ochoa P, Cáceres P, Sánchez P. Incidencia anual de caries dental en la población infantil de comunidades urbano-marginadas de Sol Naciente-Carabayllo (Annual incidence of dental caries in infants of underserved communities from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:45.
18. Bernabé E, Castillo G, Paredes E, Delgado E. Perfil epidemiológico de caries dental en dentición decidua y permanente en comunidades urbano-marginadas de Sol Naciente-Carabayllo (Dental caries in permanent and deciduous dentition in underserved communities from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:44.
19. Bernabé E, Santander F, Vargas E, Sánchez P. Variación en las conductas en salud oral de adolescentes y adultos de comunidades urbano-marginadas de Sol Naciente-Carabayllo (Surveillance of oral health behaviors between

- children and adolescents from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:73.
20. Delgado E, Arotoma B, La Rosa R, Bernabé E. Variación en los conocimientos en salud oral después de una intervención preventivo-promocional en Sol Naciente-Carabayllo (Variation in oral health knowledge after a preventive-promotional intervention in Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:72-3.
 21. Sánchez P, Loyaga K, Paredes E, Bernabé E. Frecuencia y nivel de pobreza en siete comunidades urbano-marginadas de Sol Naciente-Carabayllo (Frequency and level of poverty in seven communities from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:84-5.
 22. Sánchez P, Santander F, Nuñez A, Delgado E. Uso de servicios y medidas de autocuidado en salud oral en pobladores mayores de 12 años de Sol Naciente-Carabayllo (Use of health services and self-care measures in oral health in underserved communities from Sol Naciente-Carabayllo). *Rev Med Hered* 2005;16:71.
 23. Bernabé E, Sánchez-Borjas PC, Delgado-Angulo EK. Efectividad de una intervención comunitaria en salud oral: resultados después de 18 meses (Effectiveness of a community-based oral health intervention: results after 18 months). *Rev Med Hered* 2006 (in press).
 24. Delgado-Angulo EK, Sánchez-Borjas PC, Bernabé E. Mejora en los conocimientos, actitudes y prácticas a través de una intervención en salud oral basada en comunidad (Increase in the knowledge, attitudes and behaviors through an oral health community-based intervention). *Rev Estomatol Hered* 2006 (in press).
 25. Bernabé E, Delgado-Angulo EK, Sánchez-Borjas PC. Resultados de un sistema para la vigilancia de caries de la infancia temprana (Results of a surveillance system for early childhood caries). *Rev Med Hered* 2006 (in press).
 26. Bernabé E, Ludeña MA, Beltrán-Neira RJ. Self-perceived public health competency among recent dental graduates. *J Dent Educ* 2006;70:571-9.
 27. Kassebaum DK, Hendricson WD, Taft T, Haden NK. The dental curriculum at North American dental institutions in 2002-03: a survey of current structure, recent innovations, and planned changes. *J Dent Educ* 2004;68:914-31.
 28. Ayers CS, Abrams RA, McCunniff MD, Goldstein BR. A comparison of private and public dental students' perceptions of extramural programming. *J Dent Educ* 2003;67:412-7.
 29. Mofidi M, Strauss R, Pitner LL, Sandler ES. Dental students' reflections on their community-based experiences: the use of critical incidents. *J Dent Educ* 2003;67:515-23.
 30. Tinanoff N. Community clinical programs at the School of Dental Medicine, University of Connecticut. *J Dent Educ* 1999;63:948-50.
 31. Bailit H. Community-based clinical education programs. *J Dent Educ* 1999;63:867-72.
 32. Bailit H, Beazoglou T, Tinanoff N, Robinson P. Financial issues in community-based clinical dental education programs. *J Dent Educ* 1999;63:902-8.
 33. Bailit H. Community-based clinical education programs: major findings and recommendations. *J Dent Educ* 1999;63:981-9.
 34. Woronuk JI, Pinchbeck YJ, Walter MH. University of Alberta dental students' outreach clinical experience: an evaluation of the program. *J Can Dent Assoc* 2004;70:233-6.
 35. Strauss R, Mofidi M, Sandler ES, Williamson R 3rd, McMurtry BA, Carl LS, et al. Reflective learning in community-based dental education. *J Dent Educ* 2003;67:1234-42.