Application Data as an Indicator for Post-Katrina Recovery of LSU Postdoctoral Dental Programs


Abstract: Devastated by the aftermath of Hurricane Katrina in August 2005, the New Orleans campus of the Louisiana State University School of Dentistry was closed for two years. With help from the university’s Systems Office, the school created a temporary campus in Baton Rouge, seventy-five miles from the New Orleans campus. The eight postdoctoral education programs, however, were forced to find clinic and seminar space in other facilities and cities. Of the seventy-nine students in these programs, only sixteen did not continue after the storm. This article describes how each program maintained its curriculum while the main campus was closed. By comparing numbers of student applications to these programs in each year since Hurricane Katrina with the average baseline for each in the ten years preceding the storm, this article illustrates the current viability of these residency programs. Total applications in 2005–07 were significantly lower than baseline measures, but applications in 2008 and 2009 have returned to pre-storm levels. A comparison of these application numbers with national trends also demonstrates that these programs have rebounded from the effects of Hurricane Katrina.

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The Louisiana State University School of Dentistry (LSUSD) was among the New Orleans institutions severely damaged by Hurricane Katrina on August 29, 2005. Flooding in the basement and first floor of the Administration and Clinic Buildings forced the New Orleans campus to remain closed for two years. Two weeks after the storm, dental school administrators relocated to Baton Rouge, seventy-five miles northwest of New Orleans, and with the assistance of the university’s Systems Office, began planning for a temporary dental school in Baton Rouge. The sixty fourth-year predoctoral students were placed in preceptorships in private dental offices across Louisiana. In October, temporary classrooms were located in Baton Rouge for all other students, and by December, students in the first-, second-, and third-year dental, dental hygiene, and dental laboratory technology classes returned to lectures, clinics, and laboratories at an ancillary university location known as South Campus.1

Because of limited space at the new campus, the eight postdoctoral programs—in endodontics, general practice residency (GPR), oral and maxillofacial surgery, oral medicine, orthodontics, pediatric dentistry, periodontics, and prosthodontics—were forced to locate clinic and seminar space in other facilities and cities. This article describes the impact of the crisis on these postdoctoral programs and how each adapted. In spite of this catastrophe to the city and the dental school, all programs except oral medicine succeeded in filling available spaces the following academic year. By comparing numbers of student applications to the LSUSD postdoctoral programs in each year since Hurricane Katrina with the average baseline for each in the ten years preceding the storm, this article illustrates the current viability of LSUSD residency programs. A comparison of LSUSD application numbers with national trends in postdoctoral dental applications also demonstrates that these programs have rebounded from the effects of Hurricane Katrina.
Program Adaptations to Post-Katrina Conditions

Each postdoctoral program made alternate arrangements with hospitals, private practitioners, or other dental schools to continue the clinical training of its residents. Extensive planning, negotiations, and flexibility were required to establish new sites for clinical and didactic experiences. Seventy-nine postdoctoral students registered in July for the 2005–06 academic year. After the storm, a total of sixteen of those left the school: six were released to find other schools, and ten decided to leave. Sixty-three (80 percent of the pre-storm enrollment) remained at LSUSD.

The endodontics, orthodontics, pediatric dentistry, and prosthodontics programs leased or borrowed space in offices of private practitioners in Baton Rouge or suburban New Orleans. Donations of equipment and supplies from dentists and the dental industry enabled the programs to establish temporary clinics. Once the dental school began operations on South Campus in Baton Rouge in late fall 2005, residents in most of the programs rotated to this clinic as well.

Fall semester postdoctoral didactic courses were rescheduled for the second semester or the second year of the curriculum. Seminars that had previously met more than once each week were now consolidated into one day to minimize student and faculty travel. Some departments held seminars on South Campus while others met at temporary locations in private offices or hospitals. Dentists with offices in the Baton Rouge area generously contributed office space for seminars or patient care. As facilities on South Campus expanded and improved, faculty members and residents in some of the postdoctoral programs were able to spend more time in clinics and classrooms on the temporary campus.

All programs remained fully accredited by the American Dental Association (ADA) Commission on Dental Accreditation (CODA). New directors were named for five programs—orthodontics, pediatric dentistry, periodontics, GPR, and oral medicine—during the period between the storm and the return to New Orleans in August 2007. Except for oral medicine and periodontics, these leadership changes had been planned before August 2005. Residents in the final year of their programs received certificates on time in June 2006 with the exception of students in orthodontics and endodontics. All residents in the next academic class received their certificates as scheduled in June 2007. Although residents and instructors of many programs were scattered among multiple locations, some program directors felt that the hardships created by Katrina resulted in a bonding of residents and faculty members and enabled more clinical experiences.

Individual Program Activities, 2005–07

Endodontics

Before the storm, there were eight residents in the endodontics program and two additional one-year residents from the U.S. Air Force. The Air Force residents traditionally receive their didactic training at LSUSD, then move to Keesler Air Force Base in Biloxi, Mississippi, for their clinical training. Immediately after the storm, the two Keesler-based residents transferred to another dental school to complete their didactic training. Three of the eight LSUSD residents also transferred to other programs. Two suburban New Orleans endodontists donated office space to the residents for eighteen months through May 2007, and on days that their practice was closed, residents could use all six operatories. The residents often worked ten-hour days to complete their program requirements.

Once the dental school opened temporary facilities on South Campus, all five remaining residents eventually returned to treat patients in both New Orleans and Baton Rouge. One first-year resident spent six months in the private practice of an endodontist in Shreveport. A second first-year resident received mentoring and training at the University of Mississippi dental school to complete their didactic training. Three of the eight LSUSD residents also transferred to other programs. Two suburban New Orleans endodontists donated office space to the residents for eighteen months through May 2007, and on days that their practice was closed, residents could use all six operatories. The residents often worked ten-hour days to complete their program requirements.

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General Practice Residency (GPR)

Before Katrina, seven first-year residents and six second-year residents were enrolled in the GPR program. Three of the first-year residents decided to leave, and a fourth transferred to another program. In a change that had been planned since spring 2005, a new director took over the program on September 1. After the storm, the remaining residents in the two-year GPR program were distributed to five state hospitals in the Charity Hospital System in central and southeast Louisiana. With two exceptions, these were clinics with existing LSUSD programs. These rotations were based on variables such as clinic availability, patient needs, graduate medical education (GME) pay lines, and resident needs. One new location, Pinecrest Development Center, provided residents with increased exposure to patients with mental and developmental disabilities. In addition, oral and maxillofacial surgeons provided opportunities for GPR residents to work in their private offices to gain experience for conscious sedation certification.

In mid-October, a dental component of the Medical Center of Louisiana in New Orleans was established in the hospital parking lot in New Orleans with one and, later, two dental chairs. A month later, a larger unit was established inside the Morial Convention Center that eventually accommodated six dental chairs. Residents continued to be distributed among institutions in Baton Rouge (including South Campus), New Orleans, Alexandria, and Houma. The post-Katrina experience helped distribute dental care to the underserved populations in more areas of the state and gave the GPR residents exposure to private practice.

Seminars in the GPR program, instead of lasting two hours per week, were held once a month for eight hours. At each location, residents also met weekly with local dentists for journal club. In 2007, the two-year GPR program transitioned into a one-year program with an optional second year.

Oral and Maxillofacial Surgery (OMS)

Twenty-one residents were originally enrolled in the six-year OMS program for 2005–06. After the storm, two residents transferred to other schools, although one left because of personal issues unrelated to the storm.

With the loss of Charity Hospital and the dental school in New Orleans, rotations in the first, fifth, and sixth years of the program were reassigned to Charity Hospitals in other Louisiana locations. The school-based resident extraction-dental implant clinic was closed until LSUSD reopened in New Orleans in August 2007. The OMS program operated in both New Orleans and Baton Rouge; seminars, case conferences, and special lectures and courses were given weekly in both cities. In the first nine months after Katrina, OMS residents were distributed throughout Louisiana. Two residents instead of the usual one were sent to the rotation at the private practice of an LSUSD faculty member in Charlotte, North Carolina. At the end of November 2005, a private practice office in suburban New Orleans reopened to accommodate three faculty members and two sixth-year residents.

In April 2006, a small level-one trauma facility opened in New Orleans. The department expanded existing rotations and, in response to patient migration, developed new clinics in state-run hospitals in central and southeast Louisiana. Although the department had initially feared a decrease in resident patient load, both trauma and elective surgical cases were abundant, and residents performed as many or more surgical procedures as before Katrina.

Oral Medicine

As a result of the hurricane, the oral medicine program was left without a hospital or treatment facility in which to provide clinical care in New Orleans or southeast Louisiana, so the program and its two residents temporarily moved to East Carolina University Brody School of Medicine and its hospital facility. In January 2006, the residents returned to Louisiana with clinical activities at South Campus, Earl K. Long Hospital in Baton Rouge, Huey P. Long Hospital in Alexandria, and Chaubert Medical Center in Houma. When the program director decided to remain in North Carolina, another member of the Oral Diagnosis Department was named as his replacement. Since the storm, no new residents have been accepted into the program, which is currently inactive.

Orthodontics

All eight orthodontic residents remained in the two-year program and rotated through preceptorships in offices of part-time faculty members and alumni from October 2005 through January 2006. Preceptorships ceased in January 2006 after clinic
space was located in two separate offices in suburban New Orleans. All clinic activities were undertaken in these two private offices until the department returned to the New Orleans dental school campus in September 2007. Active patients who moved back to the New Orleans area continued treatment in the temporary clinic facilities. New patients were screened to replace patients who had not returned to the New Orleans area. In June 2006, the program director stepped down, and a departmental faculty member assumed the duties of program director. To enable students to finish cases, the director and the department head extended the program by two months, postponing the certificate ceremony from June until August 2006.

**Pediatric Dentistry**

Immediately after the storm, one first-year pediatric dentistry resident transferred to another school. Although the other seven residents remained enrolled in the two-year LSUSD program, three first-year residents and one second-year resident temporarily transferred to programs at Baylor College of Dentistry, University of Texas Health Science Center at Houston, University of Tennessee, and Harvard University/Children’s Hospital of Boston. Three second-year residents remained in southeast Louisiana to continue their clinical training in private practice offices in Baton Rouge and at the LSUSD pediatric dental clinic at Children’s Hospital in New Orleans. Children’s Hospital, the primary clinical facility for all second-year LSUSD pediatric dentistry residents, did not sustain significant damage in Katrina and was fully functional immediately after the storm.

For a time, seminars were held at the office of a part-time faculty member in Baton Rouge, but once facilities became available in Baton Rouge, all students returned from out of state and worked at South Campus and at Children’s Hospital in New Orleans. The program director was seriously ill and retired in summer 2006; his replacement, a member of the pediatric dentistry faculty, was not officially named until July 2007.

**Periodontics**

Ten students were enrolled in the three-year periodontics program before the hurricane. Immediately afterwards, the program director received an offer from the University of Colorado Denver School of Dental Medicine to move the periodontics residents to Denver to continue their training. The four second-year residents and three third-year residents moved to Denver with the LSUSD faculty member, but the first-year residents were released to make other arrangements since they could not be accommodated in Denver. All three first-year residents eventually completed periodontics training at other schools.

The third-year residents graduated in Denver in June 2006. Because the program director elected to stay at the University of Colorado, the program returned to South Campus at the beginning of the 2006–07 academic year under a new director selected from the periodontics faculty. Three new first-year residents also began the program in Baton Rouge, joining the four returning third-year residents. All training was at South Campus, although third-year residents rotated back to Denver periodically to complete cases.

**Prosthodontics**

Before the storm, seven students were enrolled in the three-year prosthodontics program. One first-year student withdrew, leaving two students in each year. With the loss of classroom space, the program director created a virtual seminar, e-mailing PDF files of articles to residents. Each student then wrote abstracts of assigned articles and e-mailed them to program members. The department leased clinical space from a private practice in suburban New Orleans and increased clinic hours to make up for time lost since September. Non-routine laboratory procedures were completed on South Campus in a laboratory with full capability and four laboratory technology faculty members. The three residents who entered the program in fall 2006 commuted to South Campus to teach in preclinical courses.

**Methods**

To conduct the applicant analysis, application data were collected from the LSUSD Office of Advanced Education for each postdoctoral program from 1995 through 2009. National data for the same years were obtained from the ADA survey of advanced dental education. Data were analyzed to determine if Hurricane Katrina affected the number of applications to the LSUSD postdoctoral programs.

Data for the number of applicants during the ten years (1995–2004) prior to Hurricane Katrina were used to estimate the pre-Katrina baseline mean
number of applicants for both LSUSD and the nation as a whole. The number of applicants in 2005 and subsequent years was compared to this baseline. The 1995–2004 data were used to calculate the means and standard deviations, which were used to compute z-scores and corresponding p-values for the number of applicants in 2005–09. The p-values (p<.05) represent the probability that the number of applicants that year were observed due to chance variation if the true mean and standard deviation were the same as estimated from the ten-year baseline data.

Results

As shown in Table 1, the total number of postdoctoral applicants to LSUSD in 2005 was significantly lower than the baseline average, but no single program contributed more to this decrease than any other. In fact, applications to the periodontics program increased significantly that year. In 2006, three programs experienced a significant decrease in applications that by chance alone would not have been expected; this is reflected in a significant drop in the total number of LSUSD postdoctoral applications for that year. In 2007, while total applications were significantly lower than in the previous ten years, no single program contributed statistically more to the decline than another. In 2008 and 2009, the total application numbers are consistent with the baseline mean of the previous ten-year period, although the endodontics program experienced a significant increase in applications in both years and periodontics experienced an increase in 2009.

Analysis of national application data over the same period shows no significant changes until 2008 (Table 2). In that year there was a significant increase in overall applications due to increases in the pediatric dentistry, periodontics, and prosthodontics programs.

Discussion

The impact of Hurricane Katrina on New Orleans and the Gulf Coast region has been dramatic. In the wake of the failed levee systems, the population of New Orleans was dispersed throughout the United States, and five years later, many residents still have not returned. For two years, LSUSD remained on a temporary campus seventy-five miles away from the city. The impact of Hurricane Katrina on postdoctoral applications to the dental school was not immediately realized. In 2005 the deadline for applications to periodontics was August 15 and orthodontics was September 1. All other programs had deadlines after September 1. As a result, the number of applications to the postdoctoral programs in 2005 would not have been entirely affected by Katrina. Only those programs with deadlines after August

Table 1. Applications to LSUSD postdoctoral dental programs, 1995–2009

<table>
<thead>
<tr>
<th>Program</th>
<th>Baseline Mean 1995–2004 (95% CI)</th>
<th>2005 Applications (p-value)</th>
<th>2006 Applications (p-value)</th>
<th>2007 Applications (p-value)</th>
<th>2008 Applications (p-value)</th>
<th>2009 Applications (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSUSD Total</td>
<td>457.4 (416.1–498.7)</td>
<td>342 (0.023)*</td>
<td>233 (&lt;0.001)*</td>
<td>340 (0.021)*</td>
<td>373 (0.072)</td>
<td>443 (0.401)</td>
</tr>
<tr>
<td>Endodontics</td>
<td>55.9 (46.8–64.9)</td>
<td>51 (0.379)</td>
<td>53 (0.396)</td>
<td>60 (0.264)</td>
<td>97 (0.004)*</td>
<td>84 (0.036)*</td>
</tr>
<tr>
<td>General Practice Residency</td>
<td>34.6 (27.7–41.4)</td>
<td>26 (0.235)</td>
<td>35 (0.486)</td>
<td>35 (0.486)</td>
<td>25 (0.210)</td>
<td>41 (0.294)</td>
</tr>
<tr>
<td>Oral &amp; Maxillofacial Surgery</td>
<td>81.1 (66.1–96.0)</td>
<td>65 (0.267)</td>
<td>56 (0.166)</td>
<td>56 (0.166)</td>
<td>66 (0.280)</td>
<td>73 (0.378)</td>
</tr>
<tr>
<td>Orthodontics</td>
<td>133.3 (111.5–155.1)</td>
<td>115 (0.314)</td>
<td>52 (0.016)*</td>
<td>87 (0.110)</td>
<td>80 (0.079)</td>
<td>113 (0.295)</td>
</tr>
<tr>
<td>Pediatric Dentistry</td>
<td>63.4 (52.8–73.9)</td>
<td>40 (0.100)</td>
<td>20 (0.009)*</td>
<td>69 (0.378)</td>
<td>70 (0.358)</td>
<td>70 (0.358)</td>
</tr>
<tr>
<td>Periodontics</td>
<td>19.7 (16.2–23.2)</td>
<td>30 (0.044)*</td>
<td>5 (0.007)</td>
<td>18 (0.388)</td>
<td>25 (&lt;0.001)*</td>
<td>42 (&lt;0.001)*</td>
</tr>
<tr>
<td>Prosthodontics</td>
<td>15.6 (13.1–18.2)</td>
<td>15 (0.442)</td>
<td>12 (0.205)</td>
<td>15 (0.442)</td>
<td>10 (0.100)</td>
<td>20 (0.162)</td>
</tr>
</tbody>
</table>

*Significantly different from expected by chance under baseline means and standard deviations.
29 could have possibly seen decreased application numbers; individuals may have decided against applying to an LSUSD program after the storm. None of the LSUSD programs participated in the American Dental Education Association’s Postdoctoral Application Support Service (ADEA PASS), so all applications would have been mailed directly to the school. Since the LSUSD mail room was on the first floor of the building, which was inundated by four feet of water, it is quite possible that some applications were destroyed. After August 29, postal service in New Orleans ceased, and eventually dental school mail was rerouted to Baton Rouge. Additionally, because many post offices were damaged in the storm, some applications may have been lost at these sites. The total number of applications sent to LSUSD in 2005 will never be known.

The most significant decrease in applications to the LSUSD postdoctoral programs can be seen in 2006. As the long-term impact of Hurricane Katrina became evident in the ensuing months, some applicants may have avoided applying to LSUSD. Since the LSUSD mail room was on the first floor of the building, which was inundated by four feet of water, it is quite possible that some applications were destroyed. After August 29, postal service in New Orleans ceased, and eventually dental school mail was rerouted to Baton Rouge. Additionally, because many post offices were damaged in the storm, some applications may have been lost at these sites. The total number of applications sent to LSUSD in 2005 will never be known.

The most significant decrease in applications to the LSUSD postdoctoral programs can be seen in 2006. As the long-term impact of Hurricane Katrina became evident in the ensuing months, some applicants may have avoided applying to LSUSD. The national baseline average does not reflect a significant decrease in applications, so potential LSUSD applicants may have assumed that the quality of education was inadequate. Even with the reduced number of applicants, however, the program directors were confident that they selected qualified individuals for the next academic year. Since 2007, all programs have returned to application numbers expected within their previous ten-year baseline average, and some even had higher than expected applications compared to that baseline.

Residents of southern Louisiana continue to live with memories of the storm; unfortunately, potential applicants to postdoctoral programs may retain a perception that New Orleans and LSUSD still suffer from the effects of Hurricane Katrina. Most applicants’ evaluation of postdoctoral programs is based on the academic and clinical experience they expect to receive, but other issues are typically included in the decision making process of where to apply or rank in a matching program. After Hurricane Katrina, applicants to LSUSD may have been concerned with safety, housing, amenities, and services in the city. They also may have doubted that the dental school facilities were restored to satisfactory conditions or that the size of the patient pool was adequate for student needs. Some of these factors may explain why the overall LSUSD applications were still significantly lower in 2007. Although there is no statistically significant difference for the applications in 2008–09, the data show slightly lower application levels than before the storm.

Conclusions

In the first two years after Hurricane Katrina, postdoctoral programs at LSUSD maintained ac-
ceptable levels of didactic and clinical education in spite of the challenges of less than ideal clinic settings and staff support. Since the storm, the LSUSD building and campus in New Orleans have undergone extensive renovation and improvement. The two years the building was closed provided an opportunity to update the network and data infrastructure including fiber optics, new servers, and high-speed connectivity. Due to the generosity of multiple partners including practicing dentists, dental corporations, and organized dentistry, the school has full digital radiography, electronic patient records, and electronic scheduling that did not exist prior to the storm. With the return to the New Orleans campus, the postdoctoral programs are therefore once again housed in a clinic facility designed as an educational setting, and data on applications from 2007 to 2009 indicate that interest in each program has returned to pre-2005 levels.

REFERENCES