Got Food? Characterizing Food Insecurity Throughout UC

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Introduction

Food insecurity (FI) is defined as **having limited or uncertain availability of nutritionally adequate and safe foods or having limited or uncertain ability to acquire acceptable foods in socially acceptable ways.**[1] Several factors contribute to food insecurity, including poverty, food and housing costs, and difficulty managing money or food.[2]

College students may be especially prone to FI, as many are living independently for the first time, while also juggling schoolwork and increased expenses.[3,5] FI has been associated with decreased academic performance and poor health in students,[3,4] which may significantly hinder the UC mission to *"create an educated workforce that keeps the California economy competitive."*[6]

Thus, further investigation is necessary to understand (1) the prevalence of FI throughout UC, (2) factors that contribute to student FI, and (3) how to address the needs of UC students.

Project Goals

The overall study aim is to understand issues related to food access and food insecurity among UC students.

- The goal of this study was to investigate the composition of the food environments surrounding each UC campus, to further understand availability of and student access to healthy foods.

Methods

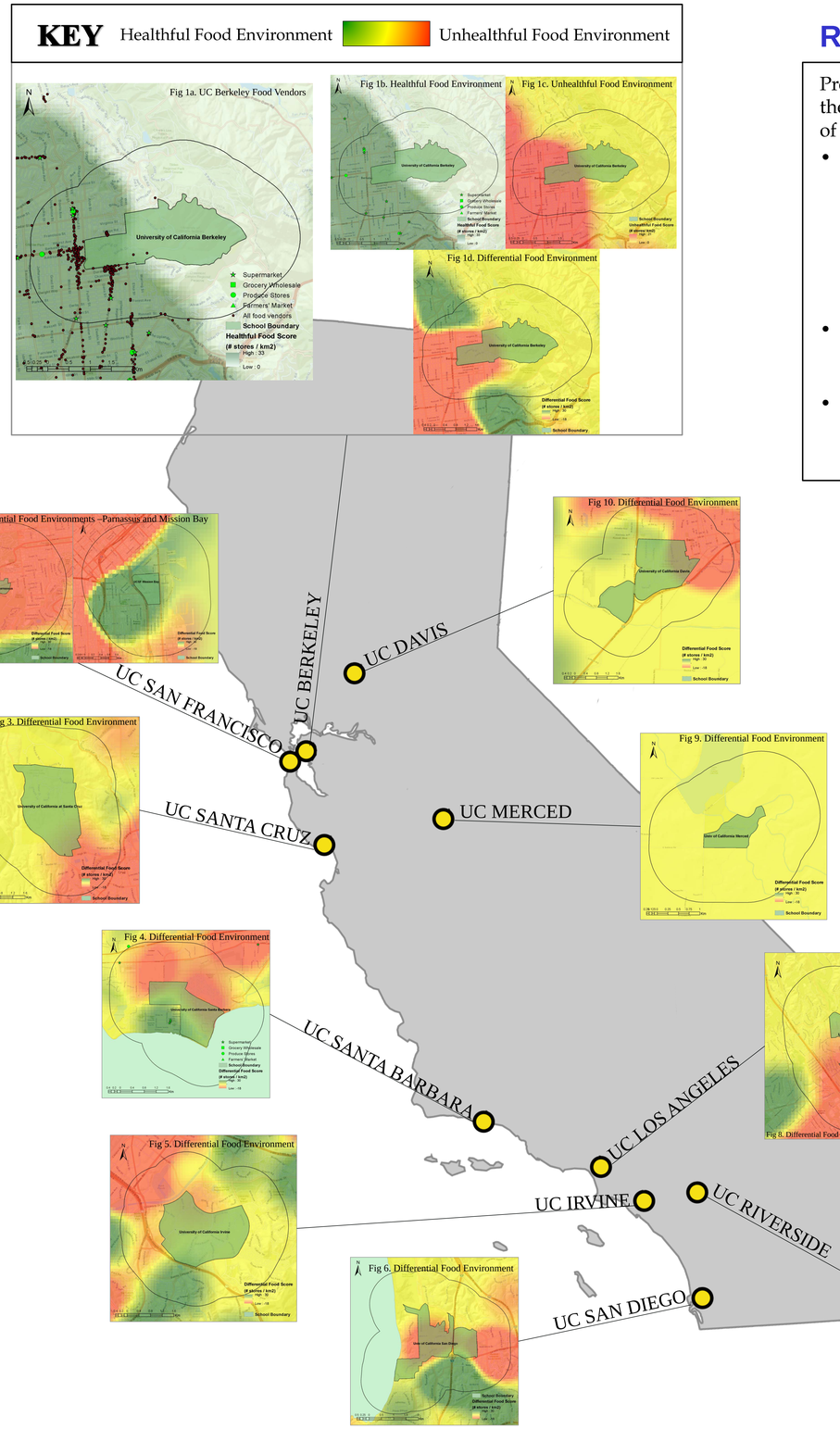
Data on the location of food retail venues were purchased from the 2011 InfoUSA database, and certified farmers' market location data were obtained from the California Department of Food and Agriculture for 2011.

Data were used to create three maps for each UC campus:

1. **Healthful Food Environment (*Fig. 1b*):** Healthful Food Scores (HFS) were calculated based on the density of supermarkets, produce vendors, and farmers' markets per square kilometer, located within a 1-mile radius around each UC campus. The map was colored using a gradient of dark green to light green, with dark green representing high and light green representing low Healthful Food Scores.
2. **Unhealthful Food Environment (*Fig. 1c*):** Unhealthful Food Scores (UHFS) were calculated based on the density of fast food restaurants and convenience stores per square km, located within a 1-mile radius around each campus. The map was colored using a gradient of red to yellow, with red representing high and yellow representing low Unhealthful Food Scores.
3. **Differential Food Environment (*Fig. 1d- Fig. 10*):** Unhealthful Food Scores were subtracted from Healthful Food Scores to create Differential Food Scores. Maps were colored using a gradient of green to red, with green representing relatively healthful (HFS > UHFS) and red representing relatively unhealthful (UHFS > HFS) Differential Food Scores.

A total of 33 maps were produced, representing UC Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, San Francisco – Mission Bay, San Francisco –Parnassus, Santa Barbara, and Santa Cruz.

An additional map of all food vendors around UC Berkeley (*Fig. 1a*) was produced to help illustrate the translation from number and location of various food vendors to Un/Healthful Food Scores.



Results & Conclusions

Presented are the Differential Food Environments for each campus (11 total), the Healthful and Unhealthful Food Environments for UC Berkeley, and a map of all food vendors located within a mile from UC Berkeley campus

- All campuses except Merced appear to have a mix of healthful (green), unhealthful (red), and neutral (yellow) Differential Food Scores.
  - 7 of these 10 campuses appear to have more unhealthful and neutral scores than healthful scores, implying that for these campuses, there are more areas where the density of unhealthful food vendors is greater than the density of healthful food vendors.
- UCSF – Mission Bay and UCSD appear to have the greatest proportions of high Differential Food Scores, while UCSF – Parnassus appears to have the greatest proportion of low Differential Food Scores
- UC Merced has a completely neutral Food Environment, because both the HFS and UHFS (not pictured) were very low – there were very few recorded food vendors at all, within a 1-mile radius of the campus.

Limitations

- It was assumed that all supermarkets and produce vendors are "healthful" and that all convenience stores and fast food vendors are "unhealthful," without accounting for nuances in nutritional quality of foods sold by each vendor
- Food vendors that do not fall into categories of "fast food," "convenience stores," "supermarkets," or "produce vendors" were not included
- On-campus food vendors were not included
- Scores do not reflect differences in pricing, which may impact accessibility
- Unpopulated regions such as mountainous areas are not distinguished from low-density food environments

Future Goals

- UC-wide survey on food access and food security was administered in Spring 2015; findings will describe food (in)security and related factors among UC students.
- Based on findings from surveys and maps, we can begin discussions with local and institutional stakeholders to increase availability of healthful foods through strategic policies and interventions

References & Acknowledgements

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The authors of this poster wish to thank Dr. Barbara Laraia for her technical aid in the creation of these maps.