CHAPTER 5:
THE KEY TAKEAWAYS FROM THE PAGL STUDY
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In this final chapter we seek to provide a summary overview of the main findings of the various dimensions of our study and, wherever possible, to point to some potential action items that might be considered by the communities themselves in collaboration with our partners (the Fundación Comunitaria Puebla [FCP], Fundación Mónica Gendreau [FMG], and by the Benemérita Universidad Autónoma de Puebla [BUAP]).

The Context

The main goal of the study was to undertake a health needs assessment of very poor agricultural pueblos in the State of Puebla, and our selection was driven by communities in which our partners were working on various projects identified by each community (mostly but not exclusively agricultural extension efforts). UT-Faculty mentors made the final selection after visiting a number of pueblos and elected to work in two of the agricultural pueblos (Xochiteopan and Colonia Agrarista), which while being physical adjacent and sharing many characteristics, were also sufficiently different as to offer variation in responses to health and poverty challenges. They were unequivocally rural agricultural communities, both at a similar considerable distance from the nearest major town and market (Atlixco). San Francisco Xochiteopan was the larger of the two, ostensibly more developed (paved streets, more consolidated housing construction, had slightly better access to transportation systems, enjoyed more baseline health facilities and outreach services, but had also suffered more extensively from the September 2017 earthquake. Colonia Agrarista Emiliano Zapata was fiercely independent and proud, with a much smaller population and a strong sense of community cohesion. While it had also suffered earthquake damage, the impact appeared to have been far less than in Xochiteopan. As it turned out, these *a priori* bases for selection did carry over into distinct differences in health care and community organization, which we have documented and analyzed in the chapters and which we summarize below.

The third rural pueblo was selected because it, too, offered significant *prima facie* differences with the two rural pueblos. Santa Ana Coatepec, while largely agricultural also offered more service economy activities. It was also the more consolidated pueblo with paved streets, one- and two-story houses, and relatively good transportation services. At first sight the population looked to be better off economically. Santa Ana can best be characterized as being a "peri-urban" rural community given its close proximity to Atlixco.[20] We expected Santa Ana to show

[20] Peri-urban designation relates to those communities that are beyond the city boundary but are firmly in the penumbra of the nearby town of city. They can include rural pueblos (as in Santa Ana); better off exurban commuter villages and neighborhoods often with weekend amenity homes; and increasingly throughout Mexico, low income mass social-interest housing estates promoted by developers since the late 1990s taking advantage of the lower land prices on tracts way beyond the city's built up fringe.

health profiles closer to that of the urban neighborhoods such as our fourth community of study which was a lower-income urban *colonia popular* in Atlixco itself.

Santa Ana is located under a small hill (an extinct volcano), with small side streets built off a long main street leading down to the church and its main square, which also holds the offices of the municipal president (*auxiliar*). The pueblo's water source and treatment plant are located halfway up that hillside. Scross the community the water table is quite near the surface such that many (most) households had their own well (*pozo*) in their yard. This feature of private wells also interested us.

As mentioned above, the fourth neighborhood was an urban colonia popular – Colonia Flores Magón – which had developed, or more accurately, stated as a pueblo on the outskirts of Atlixco and had expanded into a colonia popular some 40 years earlier ago and was therefore now quite close to the city center. Our selection was predicated upon the anticipated differences in health behaviors given the relative advantages of access to health providers. We also wanted to extend the study to allow us to engage with low-income informal settlements which are widespread in urban Mexico, as well as in Texas where they are known as "*colonias*" and as "informal homestead subdivisions" (Ward and Peters 2007; Ward 2015). We hoped that a future element of the AMPATH model would extend to these informal settlements as part of a health-based community outreach program in central Texas.

The Communities and the Survey Sampling

The Purpose and Goals of study were 1) to conduct a rigorous health needs assessment *a la* AMPATH; 2) to examine mental health, reproductive health and general community wellbeing, and to gauge the community organizational capacities that exist in these communities; and 3) to examine the ways in which the physical structures of dwellings and the micro lot environment may affect health and health outcomes.

In developing our sampling framework, we were aware that lot sharing among households that are close kin related (adult daughters and sons, in-laws, etc.) are a common feature of both rural and long established urban *colonia* communities. This arises for various reasons, but lead to multigenerational family and household arrangements. These can be extended household structures, or so called "compound" structures, where kin related families live separately as individual family units. A single lot may have two or three close kin related nuclear households, one or more of which may also be an extended household structure (including an elderly parent, for example). Shared lots were quite common in our survey, and we often found ourselves having to make a decision about which household (of several on the lot) to interview, and to decide how far we should explore the "reach" of health care arrangements across households living on the lot. For the most part we focused upon a single household but took cognizance that there was a broader network of experiences and perceptions among the wider family.

We adopted a mixed methods research strategy, but the mainstay was a household survey which ultimately generated 242 responses overall. While we originally intended to conduct random selection this quickly fell by the wayside, since we found ourselves heavily dependent upon introductions to households from our community partners at the "Fondo Mónica" -- Paty and Alejandro. Without their help in introducing us to households (usually those with whom they had worked in their extension activities), we would likely: 1) not have got such a positive response (or an any response at all!); and 2) certainly not received such an open and receptive response from interviewees. Does it matter that the survey was non-random? Yes, of course, to the extent to which we cannot as readily generalize to the wider community population. However, these are not highly heterogenous communities: lot size, household activities; poverty and economic levels are broadly similar, as are consumer behaviors. In addition, the number of surveys conducted in each community (with the exception of Flores Magón), represented a substantive percentage of the overall households. Therefore, we are confident that our findings are fairly representative of the baseline community as a whole.

In addition to the survey we conducted key informant interviews, focus groups on key issues that arose in the course of our survey and community engagement, and several intensive case studies to explore the ways in which dwelling environments impact upon health and wellbeing.

In Colonia Flores Magón data were gathered solely through the survey, and here we did adopt a randomized selection strategy (every N^{th} house, for example), and here any bias was largely that of whether and whom we found in and available to respond to our questions on that day and at a particular time. (We did not interview after 5:00pm.) While we had hoped for 70-80 interviews (as elsewhere), regrettably we were obliged to abort surveying for security reasons midway through the interviewing cycle (see Chapter 1).

Health Care & Quality of Attention

Gathering information about the health profiles and patterns and quality of attention received was a primary goal for our study. Given that household selection was non-random and that the data were reported by household heads for members of their family, our findings cannot be presented as generalizable prevalence or incidence rates. Rather these data report on response rates provided by the head of household (usually female) about members of her household. Our findings look at levels of reported illness and treatment: chronic illnesses; other acute periodic illnesses; and serious accidents requiring treatment. The principal findings were:

- Primary chronic illnesses reported across all three communities were: 1) Hypertension, 2) Diabetes, and 3) Musculoskeletal problems. Diabetes and hypertension are closely linked, and the high reported percentages of musculoskeletal conditions are most likely an outcome of age and/or the labor-intensive lifestyle of agricultural workers.
- "Acute illnesses" such as intestinal health disorders, respiratory and severe 'flu like illnesses are almost certainly related to a multitude of issues including, but not limited to, poor air quality (volcanic ash and smoke inhalation from wood burning), changes in

temperature and inability to control in-house warming or cooling, lack of clean drinking water, poor hygiene, and poor physical conditions of the dwelling structure itself.

We asked detailed questions about access to health care and treatment in order to identify some of the principal challenges faced by the respective communities. Especially in the case of the two remote agricultural pueblos we found the following major challenges:

- 1) The difficulties of leveraging access to health care and medical attention (due to limited transportation services, and costs of the same (especially time).

- 2) On the lack of availability of medicines in public sector facilities such that people invariably had to go to a pharmacy (usually in Atlixco), and buy the medicine out of pocket, furthering adding to the financial burden.

- 3) On the relative quality of the actual treatment received. Significantly, our findings show that even with Seguro Popular coverage, a large proportion of the population seek treatment from private providers – doctors whom they know and trust and can see more expeditiously (by appointment). This implies higher costs as the private providers must be paid for: Specifically:

  Public vs private sector. Nearly one third are using private sector despite the increase cost of receiving private treatment. The reasons appear to be:

  - That private providers are utilized more because of increased confidence, trust, and continuity from care givers versus public clinics and hospitals (the public provider in Xochiteopan rotates every 6 months)
  - The fact that in most cases medicines must be purchased at a pharmacy anyway, even when treatment is in the public sector. This makes private treatment a better option for many even though they pay for the actual consultation.
  - Private consultation charges are considered to be reasonable, especially taking account of the time saved (avoiding long wait times etc.)

  Although only a relatively small proportion of households reported a severe accident in the previous 12 months, given the severity and high costs, most treatments would be in public sector facilities – as would major surgeries and hospitalizations.

- 4) Women's health and reproductive health services; breast and cervical cancer screenings, etc.

  - Awareness and knowledge about such services was good and household perceptions were generally quite positive, largely we believe as a result

of the PROSPERA program (since terminated by the López Obrador administration).

- Significantly this level of positive perceptions and usage of public sector services for reproductive services is in sharp contrast to the health care patterns outlined above.

- 5) Nutritional Practices. Given the high levels of reported diabetes and the obesity epidemic in Mexico, we asked questions about nutritional intake both generally, as well as in less nutritious foodstuffs. Our findings are:

    - Regular soda and juice (sugar added) drinking is quite high at around one quarter (25%) of households consuming several times a week. Our data (and focus groups) suggested that this was because people liked sodas, and we found some resistance to change. Another reason for drinking soda and juices are that it is a source of clean hydration, whereas the tap water may not be perceived as drinkable/safe.

    - Processed foods: candy, cookies, chips etc., were also widely consumed (45%) especially to kids after school and were usually bought from local corner stores.

    - Undertaking healthy nutritional practices is a challenge for many households due to the costs and the seasonal nature of access to fruits, vegetables, etc. Many households cannot afford meat and eat it only once a week or less. Vegetables are purchased at the market in Atlixco, which is a far drive from the rural communities and is, for many, a once weekly shopping trip.

Mental Health and Community Wellbeing

Following on from our questions about health we felt that it was important to get a clear sense of respondent perceptions of mental health and to ensure that the issue of mental health was placed firmly on the agenda in terms of low-income communities and public health. We also explored perceptions about common health challenges faced in each community (alcoholism, drug use, smoking, domestic violence, etc.). We were also interested to gauge the level of community interaction and solidarity – collective social capital -- that would help to confront such challenges. Given the high levels of out migration from Puebla to the USA, and what we anticipated would be a relatively high level of connectedness to those who had kin in the USA, we were interested in knowing more about the frequency of contacts and the extent to which there is a heavy reliance upon remittances and engagement with family that affects health.

In order to examine the issue of mental health we used three standardized measures adopted by the World Health Organization: namely Patient Health Questionnaire (PHQ2) – Depression; Generalized Anxiety Disorder (GAD2); Perceived Stress Scale (PSS). Including these mental health measures in our study was innovative since it rarely figures as a major arena in public health issues – at least not in low income and rural communities. On the basis of our findings we argue that it should firmly be on the agenda of BUAP and public health agencies.

Standardized Tests on Mental Health

Stress levels were moderate to high in all four communities and are likely a reflection of the emotional toll of living in marginalized and economically poor communities. In other words, unlike anxiety and depression, stress was elevated in all four communities. Also, the Flores Magón scores were consistently higher across all three measures.

We also found that many respondents were uneasy about recognizing mental health in terms that are not "pathological" and abnormal. There is an obvious need for improved communication, especially in addressing the stigma often associated with mental health.

One area where we found high levels of anxiety and stress appeared to be related to the 2017 earthquake and the ongoing seismic activity in the area. To assess the mental health toll of the earthquake we asked people if they had experienced "depression" "anxiety" or "fear" in its aftermath. Significantly, all communities registered very high reports of at least one of the symptoms as being very high due to the earthquake (between 78% and 94% of respondents). Of these, "anxiety" is the most recognized and tangible. The earthquake had a profound psychological impact which persists today, and could provide a "hook" to get people to think and talk about other areas of mental health as non-stigmatized.

Community Perceptions of Addiction, Mental Health etc.

As well as trying to assess how people viewed mental health, we asked respondents about the extent to which they perceived mental health issues to be a problem in general. We also asked about perceptions of the presence and levels of severity of practices such as alcoholism, smoking (tobacco), drug abuse, and domestic violence.

In two of our communities, one rural one urban, a third of the respondents described mental health as a "serious problem." Our data also show fairly high perceptions that alcoholism, tobacco, and drug abuse are problems within the community. This was especially the case in the urban community of Colonia Flores Magón. Two communities reported significant levels of domestic violence while the other two reported comparatively lower levels of the same. It should be noted that particularly in the rural communities, there's no place to actually address these problems: specifically, no community-based rehabilitation centers or professionals who are able to talk to people about these challenges. Similarly, as mentioned above, there is no space to talk about mental illness or substance abuse, both of which remain highly stigmatized.

Community Cohesion:

Overall, rural communities see themselves as having fewer mental health problems compared to the urban community. Moreover, rural communities appear to have significantly greater cohesion and optimism about their future. Optimism about the future was high in the two most rural communities, which we interpreted in part as a reflection of the ongoing community infrastructural and other improvements: in Colonia Agrarista the construction of a new clinic; and in San Fco. Xochiteopan the road link to the upper and newer part of the community, although other variables may account for these indicators of community wellbeing,

In Colonia Flores Magón, community solidarity and mobilization would have been high when the *colonia* was first established and populated but has long since attenuated. It was the outlier when measured in terms of community cohesion and optimism about the future, and many expressed their concerns about smell and unhealthy conditions arising from the barranca alongside one edge of the *colonia*, and also about insecurity. Flores Magón also scored consistently higher on all of our mental health measures, indicating greater mental health concerns in that neighborhood.

Immigration and Links to the USA

As is well documented in the literature, the state of Puebla and its rural communities are widely engaged in transnational networks. Such networks can be important especially in so far as there is regular communication between households and family members living in the USA, as well as generating remittances to rural households which can be important to bolster subsistence, to pay for the costs of medication and treatment, and for home improvements, especially after the earthquake.

Our study found all of these things. Almost 50% of the households interviewed had a close family member living in the USA, and some had themselves spent time living in the USA. Communication with family remembers was generally frequent. In two of our intensive case studies we were able to document the importance of this regularity of contact and its impact upon health care and home improvement.

Housing and Health – Summary of Findings.

There is widespread research about how the micro housing environment can impact health, not least since, in the USA and Europe, people spend over 70% of them time indoors. Also, there is considerable research and policy advocacy relating to “ageing in place”, especially around the idea of retrofitting dwellings and ensuring that neighborhoods retain a mixture of housing opportunities that can continue to accommodate the elderly (Bogolasky and Ward, 2018).

However, there is less research about housing and health in less developed country environments, especially low-income neighborhoods and in informal housing settlements

(Corburn and Riley 2015). Moreover, in Mexico as in many cultures of Latin America, the elderly either age-in-place usually by living in multi-generational households with their adult children and grandchildren; or they move-in to love with one of their adult children. In our surveys we saw many examples of the first scenario, where multi-generational families live together in a single-family unit (extended household), or as two or more separate nuclear units living on the lot and sharing facilities (kitchen, cooking spaces). All this makes the study of housing and health even more salient.

The wider survey, our interviews and focus group discussions, together with the insights formed by five intensive case studies provide fresh evidence of the importance of looking to the micro (dwelling and lot) environment and the ways in which the physical fabric and the environmental context interact and shape people's health and wellbeing. Household and individual behavior can mitigate or accentuate risks. Our research has also complemented the literature by providing a more nuanced understanding of the physical and behavioral interactions in poor rural pueblos in Mexico.

Infrastructure Water and Drainage

1) Likely low chlorination and the alternative water provision practices means that water should be systematically boiled and/or filtered, and wherever possible refrigerated, before drinking.

2) Bottled drinking water is rarely consumed in the poorer pueblos, although it is more widely used in the better off peri-urban pueblo of Santa Ana, and in urban *colonias* and neighborhoods. Cost is the primary mitigating factor.

Sanitation is generally through pit latrines and septic tanks. In such conditions it seems probable that close proximity to farm animals and animal feces will be a likely contaminant (direct or indirect) of water tanks and therefore of household water usage such as washing, bathing, cleaning, etc.

Many streets lack formal paving, and this inhibits access and mobility especially for the elderly and infirm.

Household Behaviors with the Home:

Our surveys and sampling while interviewing revealed poor air quality levels using measurements of particulate matter in the air (pm2.5 and pm10.0). While communities periodically suffered from deposits of ash from the active volcano Popocátepel (depending upon the wind direction), most of the poor-quality air derives from cooking practices that use wood or carbón (charcoal). This is especially true in the two rural pueblos where wood is widely available and is culturally preferred for cooking. We also found that plastic cups are often used as an accelerant when starting the fire. Cooking is generally done away from the house in a lean-to or in a single room of *lámina de carton* with little ventilation.

In Santa Ana and Flores Magón, propane gas is widely used, posing a lesser threat to health.

A primary challenge, therefore, is the need to improve air quality via:

- Ensuring greater (or more adequate ventilation) around wood burning stoves and ovens. And to promote the adoption of safer fire lighting procedures (I.e. not using plastic as an accelerant).
- Keep children away from the smoke and cooking area since their lungs are less capable of resistance to damage and inhalation can exacerbate asthma, and other respiratory diseases in younger children.
- Increase awareness about CO2 (how it is produced through exhaling, car exhaust etc.), and the widespread existence of above poor air quality due to (unseen) CO2 levels. Ventilation is key here, especially in bedrooms and enclosed spaces.
- Avoid storage of chemicals and fertilizers close to, or in spaces that are used for sleeping or dining. They make for poor or even hazardous air quality.

On the dwelling structures and lot management

Unlike in the USA and in most urban areas where people spend a large part of their daily lives indoors, rural populations such as those we observed in Puebla, spend most of their time outside – either in the fields, or in the outside patio -- cooking, playing, relaxing, and eating. They use the indoors far less, and rarely for cooking unless they have electric and gas stoves.

Housing Structures and Health Hazards and Risks, namely:

- Some rooms still have dirt floors.
- Most dwellings mixed materials (permanent and temporary) walls and roofs.
- Kitchens are often separated from the house itself and are made of *lámina de cartón* which pose fire risk and poor physical conditions (pests, earth floors, difficulties to keep clean, etc.).
- Attention to minimize damp and high humidity especially in sleeping spaces.
- Improve ventilation and air circulation by ensuring that windows and openings provide for a throughflow of fresh air.
- Increase natural lighting in rooms, especially where there is none.
- The dangers from uneven floors and walking areas that impede mobility and pose a threat to falls. The same applies to external lot surfaces which often hazardous to mobility.
- Maintain a healthy level of separation between farm animals and household sleeping and eating and food preparation spaces.

Overall, as well as health implications arising from the dwelling and micro environments (poor water and air quality; dampness; exposure to cold and heat; bites from insects and pests, etc.), downstream mobility challenges are likely to become more salient especially for the elderly.

Final Thoughts

Much of what we have described and analyzed in this report provides a snapshot of health and housing conditions in the summer of 2019, at the beginning of the rainy season, and as households began planting their crops. (It was real pleasure to return in mid-October and to see these crops when they were ready for harvesting.) Collectively we are enormously thankful to the households themselves, many of whom held back from going out to their field for a couple of hours in the morning in order to spend time with us.

Our work has begun to provide important baseline information about these four communities, and especially about the three rural and agriculturally based communities. We believe that these findings will provide wider insights since such communities are rarely studied systematically from a health needs perspective. Nor are they studied in such depth. As we underscore in Chapter 3 and above, mental health is a key part of good health and wellbeing, yet as is so often the case elsewhere, it is stigmatized and poorly understood by community members, researchers and by formal health professionals and providers – especially the latter. In contrast, we saw that health providers are sensitized and active in providing appropriate attention in the arena of reproductive and female health care.

Looking to the future, further research is required alongside policies *inter alia* to:

- Improve transportation access to health care facilities and/or to promote weekly ambulatory services to the villages.
- Accelerate national campaigns designed to reduce consumption of sugary drinks and to ensure that campaigns permeate into rural communities, and to residents who can least afford the costs.
- Improve access to medicines at low cost either through public health providers or through pharmacies, or both.
- Encourage the creation of support groups within the community to address minority health needs such as those with disabilities (Downs Syndrome children for example); pre- and post-natal maternal care; those suffering from with hypertension and diabetes; and those with mobility challenges, etc.
- Develop greater awareness of mental health needs of low-income communities and to better understand the stressors that trigger the presentation of mental health problems, as well as to research how populations self-medicate (if they do) to overcome mental health challenges (alcohol, drugs, etc.)
- Improve housing conditions such that residents have greater control over the internal climate of their residential space.

- Reduce exposure to poor air quality (especially wood smoke), especially for young children. Clean up the micro space on the lot to minimize falls through tripping, and especially to consider ways of ensuring mobility for the elderly.
- Conduct systematic environmental sampling of potable water systems and provide guidance about chlorination and other household practices to ensure safe drinking water.
- Research how the proximity of animals on the lot can have implications for poor health or disease among household members at different ages.

From the outset we never intended for this Report to be the end of the story, even though the undergraduate team will graduate in Spring 2020. The University and we as faculty mentors are committed to using the PAGL experience as a platform for future collaborations with our partners at the Fundación Comunitaria Puebla and at the Fundación Mónica Gendreau. At Austin and in Puebla, Dr. Adriana Pacheco's leadership and guidance has been the major catalyst for both our engagement in the PAGL, but also in fostering our collaboration with the FCP. She is a Poblana (comes from Puebla herself), is a UT graduate (PhD), philanthropist with her husband Fernando Macias, and at the time of the study was the Chair of the President's International Advisory Board. We look forward to continuing to work with her on projects of mutual interest and to supporting her in her ongoing work on the Board and at the University.

Our intensive fieldwork collaboration with faculty and interns at the medical school of the Benemérita Universidad Autónoma de Puebla has laid the foundation for a formal inter-university agreement which we hope will be put in place in 2020 and will provide the basis of future collaborations between the BUAP and Dell Medical School at UT-Austin. Working directly with the Secretaría de Salud Puebla, and through BUAP Medical School, it is hoped that several of the aforementioned research and policy ideas will be put into motion.

Several research papers co-authored by the students and the faculty have been accepted for presentation at major international conferences, specifically: The Consortium of Universities for Global Health (CUGH) annual meeting in Chicago in March 2020; and the Latin American Studies Association (LASA) congress in Guadalajara in May, 2020; and at the October 2019 meeting of Health Systems Global which is a precursor to a World Health meeting in Abu Dhabi in November 2020.

The PAGL study was also an opportunity to start thinking about how the AMPATH program (Academic Model Providing Access to Health Care), developed by Indiana University and its Kenya counterparts and the Kenyan government (https://www.ampathkenya.org/mission-vision) might be extended to communities in Mexico and Texas.

In 2020 also, our graduating students have ambitious plans to fundraise and collaborate with residents and friends in Xochiteopan and Colonia Agrarista in developing a small playground/exercise facility or some other small project proposed by the community. UT professor Dr. Benjamin Ibarra, who worked in parallel with the team in 2019 on projects of

church and monument restoration, has kindly offered to collaborate on these two projects by making these the centerpiece of his architectural students' class project in the Spring.

Finally, we are delighted that an undergraduate and faculty team wishing to work on Puebla have been successful in the second round of the PAGL awards competition. In part building off our project, that team will be investigating diabetes, working with patients in Puebla and Atlixco, and following patients and their families back into their homes. We look forward to following their PAGL research and engagement project, and especially to seeing how their work on diabetes – one the principal chronic illnesses identified in our study – meshes with the people and communities in which we found such a welcome and positive response.

References for Chapter 5

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