Language and Liability: Understanding How Language Impacts Access To and Quality of Wildfire Preparedness Information

The Latinxs & the Environment Initiative

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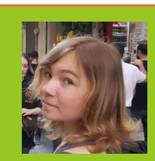

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Background

By 2100, researchers have predicted that the amount of area burned by wildfires in California could increase up to 77%. The undeniable growth of wildfire in California calls for a need to prepare our communities. Wildfire preparedness comes in a variety of forms, with the most effective being creation of defensible space and home hardening.

Survival is based on the efforts of the entire community, with each individual playing a role to complete preparatory tasks. Direct flames from a structure threaten neighbors. Therefore, a community inclusive mindset is best for overall resilience. Due to this need for community preparedness, access to defensible space and home hardening information is more important than ever. However, recent studies indicate that nearly 55% of individuals do not maintain defensible space nor prepare due to lack of knowledge. Due to California's diverse makeup of language, language barriers may limit access to resources.

The purpose of this study is to investigate which counties are most in-need of translation for wildfire preparedness information and to characterize how effectively vulnerable counties meet the translation needs of their communities.

Methodology

Phase I: Identification of most in-need of translation

Each county received a two-part normalized score using measures of language/population and wildfire risk. Data used:

- Number of and average ranking of priority fuel reduction projects (CAL FIRE 45-day report)
- Percentage of county area designated as "Very High" severity risk (CAL FIRE Fire Hazard Severity Zone Maps)
- Average percentage of county area burned per historical fire (CAL FIRE 1878-2019 data)
- Projected percentage population growth (2010-2060)
- Percentage of population classified as English-Learners (K-12 CA Dept of Education assessment)
- Percentage of households labeled as a "Limited-English Proficiency Household" (US Census)

Phase II: Information analysis of top five in-need

Wildfire preparedness info was assessed for English and top three limited languages per county (identified by CA 2020 Language & Communication Access Plan). Type of information was restricted to online resources. Data used:

- Number of online resources per language
  - Fire department website pages, social media, local fire safety councils, programs, etc
- Type of translation used (human vs Google Translate)

Results I: Most In-Need Counties For Preparedness Translation

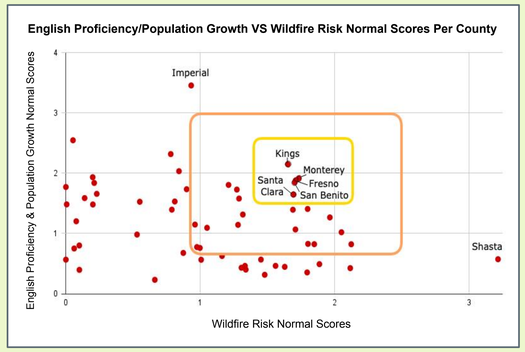

Fig 1: Normal scores (shown as language vs. fire)

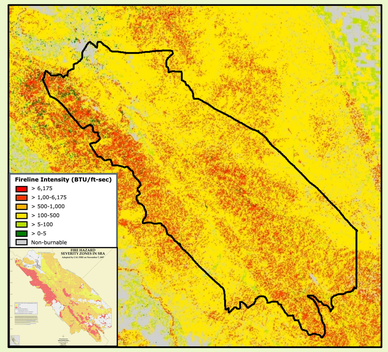

Fig 2: San Benito data comparison

Five counties were identified as most vulnerable to both limited English proficiency and wildfire impact:

- Fresno
- Kings
- Monterey
- San Benito
- Santa Clara

Due to yearly variability in data, 17 other counties have been identified as alternative vulnerable candidates (Fig 1 orange border). To reduce data variability, wildfire risk area/zone data was compared with FLAMMAP simulations in 97th percentile weather conditions (fig 2, lower left is CAL FIRE data).

Alternative counties: Alameda, Butte, Contra Costa, El Dorado, Lake, LA, Napa, Mendocino, Santa Barbara, Santa Cruz, San Diego, SF, San Mateo, Tehama, Ventura, & Yuba.

Results II: Disproportionate Use of Translation AI & Unmet Needs

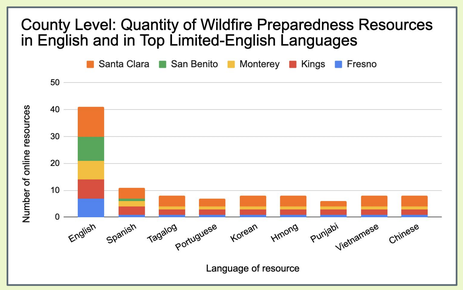

Fig 3: # of county resources by language

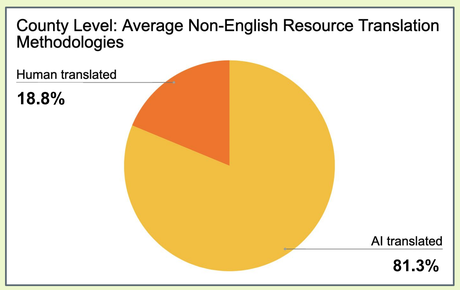

Fig 4: Average county translation methods

- On average, there are **5.5 times more English resources available than non-English resources** despite English-only speakers comprising an average 52% of the population (Fig 3)
- Of the existing non-English information on the county level, on average **81.3% of sources are translated by Google Translate Artificial Intelligence** (Fig 4)
- **95-99%** of Tagalog, Portuguese, Korean, Hmong, & Punjabi resources are **google translated**
- On the state level (CAL FIRE + CA OES), there is a smaller disparity between languages: there are **1.8 times more English resources available than non-English resources**

Conclusions

The resulting data demonstrates a large disparity between English and non-English language translation of wildfire preparedness resources. Although on average there are more English speakers, there is a need to include and support as many community members as possible to improve overall community safety and preparedness.

Additionally, the extreme amount of translation done by artificial intelligence indicates low quality of existing translated resources. Google Translate surveys in 2017 indicate a 85% accuracy rate; a 15% error rate is significant especially when translating large amounts of information. Such error is not acceptable for critical safety and preparedness information.

Another danger of relying on artificial intelligence translation technology is the incapability to distinguish between and account for regional dialect differences. Languages such as Spanish have multiple diverse dialects depending on community location and makeup (Castilian Spanish vs. Caribbean Spanish vs. Colombian Spanish etc). Current AI is inconsistent at distinguishing between dialects, hence mistranslation is extremely common for various languages.

Next Steps

Given the lack of translation and questionable quality, emergency management agencies, particularly on the county level, should consider the following suggestions:

- Allocating greater resources to hire additional translators for official preparedness and defense information
- Creating and maintaining separate social media pages/web pages for the main languages of limited English speakers
  - Online resources, especially those on the social media level, are extraordinarily accessible and easy to share
- Investing in and encouraging current AI translation research to improve accuracy and dialect coverage

Further relevant questions that should be investigated include:

- What forms of information are most effective at encouraging community members to participate in wildfire preparedness?
- How does cultural background influence preparedness?

Acknowledgments

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