Zika Busters

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01. Elevator Pitch

We're developing a Watson integrated product with the goal of identifying high risk Zika locations using weather data. This technology will supplement a SMS process to help diagnose possible Zika victims.

PROTECT YOUR FAMILY AND COMMUNITY:
HOW ZIKA SPREADS

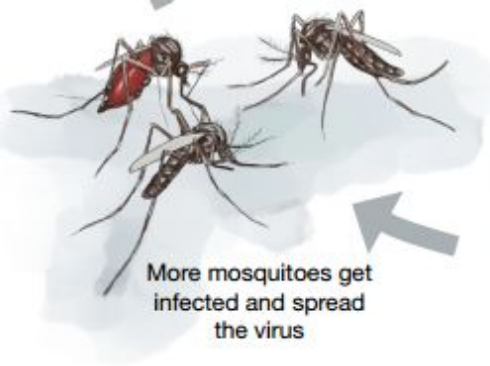
Most people get Zika from a mosquito bite

A mosquito bites a person infected with Zika virus

The mosquito becomes infected

A mosquito will often live in a single house during its lifetime

The infected mosquito bites a family member or neighbor and infects them



More mosquitoes get infected and spread the virus

More members in the community become infected

Other, less common ways, people get Zika:

During pregnancy
A pregnant woman can pass Zika virus to her fetus during pregnancy. Zika causes microcephaly, a severe birth defect that is a sign of incomplete brain development

Through sex
Zika virus can be passed through sex from a person who has Zika to his or her sex partners

Through blood transfusion
There is a strong possibility that Zika virus can be spread through blood transfusions

CDC

Prediction

There are no ways to predict when Zika infections will spike, and recourses to the affected areas are limited and slow to deliver.

Healthcare

The population that is most at risk is uneducated about the symptoms and signs of Zika, leaving them with the impression that it is the common flu.

Predict Infections from Weather Data

Mosquitos are predictable, historical weather data can be used to forecast future infections.

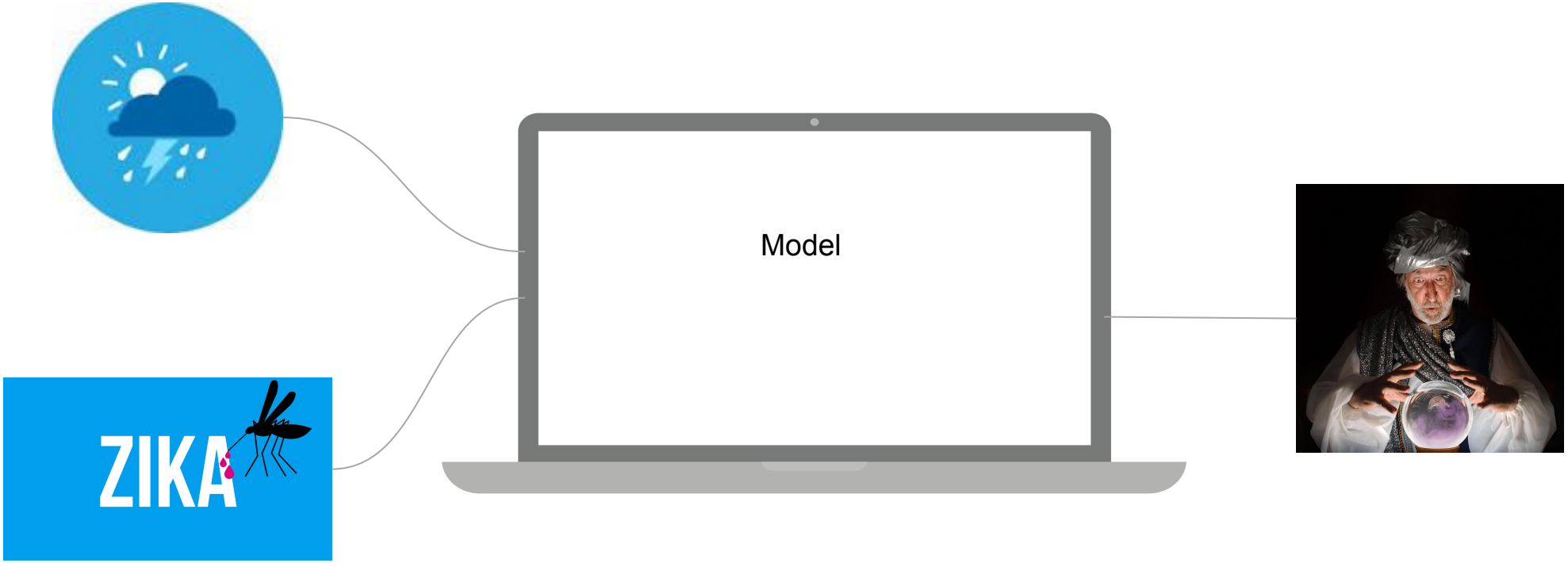
Notify Relief Agencies

Using the forecasted weather we can give relief agencies five days to prepare and respond.

Educate Population

Once we have relief infrastructure, a SMS diagnoses tool will alert the population to seek medical help.

Predictive model that will highlight the likelihood of a zika outbreak given weather data



Training Data:

```
merged_data.head()
```

_min	pressure_max	pressure_mean	pressure_min	temp_max	temp_mean	temp_min	wspd_max	wspd_mean	wspd_min	zika_confirmed
	-1.177345	-1.494531	-1.403926	8.789665	-1.490906	-1.804205	0.106652	-0.181011	-0.568948	0
	-1.177345	-1.495253	-1.356565	-1.034095	-1.793407	-2.427326	-0.047103	-0.414935	-0.568948	0
	-1.175393	-1.492933	-1.356565	-1.034095	-1.794484	-2.427326	0.014399	-0.583715	-0.568948	0
	-1.179296	-1.496479	-1.359074	-0.903111	-1.696741	-2.115765	0.045150	-0.318837	-0.568948	0
	0.461100	0.622834	0.619641	-1.819995	-3.039905	-3.206228	0.106652	0.108341	-0.568948	0

Model: Logistic Regression

```
from sklearn.linear_model import LogisticRegression
logReg = LogisticRegression()
```

Test Input:

```
test_Weather = np.array([-4.75694544e-01,  -4.64399713e-01,  -3.41052734e-01,
        6.27082524e-16,   1.17584664e-15,   9.92459214e-16,
        1.57965176e+00,  -4.28510933e-01,  -3.83061571e-01,
        1.44756599e-01,   1.94199605e-01,   6.51599614e-02,
        2.29655793e-01,   8.84349299e-01,  -5.68948247e-01])
```

Prediction Output:

```
zika_prob = logReg_model.predict_proba(test_Weather)
zika_prob
```

```
array([[ 0.68029532,  0.31970468]])
```

Diagnostic Tool

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