ATTENTION

IF YOU HAVE A FEVER ALONG WITH MUSCLE ACHES AND PAINS, PLEASE STAY IN YOUR CAR AND WE WILL EXAMINE YOU THERE.
“sin nombre”

Previously undescribed hantavirus of the family Bunyaviridae

Etiologic agent of “hantavirus pulmonary syndrome” HPS

Mortality rate in excess of 50%

Primary reservoir in the Deer Mouse *Peromyscus maniculatus*
The Hantaviruses

- Hantaan
- Seoul
- ??? New Strain ???
- Puumala
- Prospect Hill
Relationship with Prototype Viruses

- SEO SR-11
- SEO R-22
- SEO B-1
- HTN Lee
- HTN 76-118
- PUU Paris
- PUU CG1820
- PUU Sotkamo
- NEW MEXICO
- ARIZONA
- COLORADO
- CALIFORNIA
- OREGON
- N. DAKOTA
- MONTANA
- P.H.V.
- LOUISIANA
Phylogeny of Hantaviruses

<table>
<thead>
<tr>
<th>Virus Strain</th>
<th>Rodent Host</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hantaan</td>
<td>Apodemus agrarius</td>
</tr>
<tr>
<td>Dobrava</td>
<td>Apodemus flavicollis</td>
</tr>
<tr>
<td>Seoul</td>
<td>Rattus norvegicus</td>
</tr>
<tr>
<td>“Thai”</td>
<td>Bandicota indicus</td>
</tr>
<tr>
<td>Sin Nombre</td>
<td>Peromyscus maniculatus</td>
</tr>
<tr>
<td>Black Creek Canal</td>
<td>Sigmodon hispidus</td>
</tr>
<tr>
<td>Bayou</td>
<td>Unknown</td>
</tr>
<tr>
<td>Prospect Hill</td>
<td>Microtus pennsylvanicus</td>
</tr>
<tr>
<td>Puumala</td>
<td>Clethrionomys glareolus</td>
</tr>
</tbody>
</table>
20 Mya

† Copemys (16 Mya)

† Abelmoschomys (9 Mya)

Oryzomys?, Sigmodon?

7-9 Mya ?

Auliscomys (4.5 Mya)
Trophic Cascade Hypothesis (TCH)

• Changes associated with El Niño alter weather patterns in U.S. Southwest
• Increased winter-spring precipitation leads to increases in vegetation and insect populations
• Increases in food and shelter increases size/density of rodent populations
• Increases in density alters the quantity/quality of SNV infection in *Peromyscus* populations
• Return of “normal weather patterns” leads to increased contact with humans
Navajo
*Peromyscus maniculatus*

- **Trapping Period**
- **Total Density (#/ha)**
- **HUMAN CASES**
- **PMMA Density**
- **PMMA Infected Density**

SNV & HPS Cases

- 4.5
- 4
- 3.5
- 3
- 2.5
- 2
- 1.5
- 1
- 0.5
- 0

Year:
- 9408
- 9412
- 9504
- 9508
- 9512
- 9604
- 9608
- 9701
- 9705
- 9709
- 9802
- 9806
- 9810
- 9903
- 9908
- 2001

Density and SNV & HPS Cases over the trapping period.
Canyon del Muerto
Carrying capacity (derived from landscape)

Typical desert landscape

Mice populations  (result of model, given the carrying capacity)

from Abramson & Kenkre (2002)