Mass Advocates for Children
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COVID-19

Amedeo Modigliani, Léopold Zborowski, c. 1916, MFA Houston

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Over 26 Million Cases and 865,000 Deaths
Over 5 Million Cases and 170,000 Deaths in the U.S

Massachusetts: New Cases per Day

MGB New Cases and Admissions

Percent of Tests with Positive Results

In the last 4 weeks:
- Symptomatic patients: ~4% positive
- Asymptomatic patients: ~1% positive
MA Disease Incidence by Community

% Positive Tests by Race/Ethnicity (MGB New Cases)

Age and Sex Distribution of New Cases (MGB)

Disease Severity in Children

91 children in South Korea with confirmed Covid-19
Tested because of travel, contact with confirmed case, or symptoms

Asymptomatic (22%)  Mild (51%)  Moderate (22%)  Severe 2%

Covid-19 Infection Mortality Rates

Mortality calculations using random sample population-wide antibody testing in Indiana to determine the true number of infected people; 425 deaths amongst an estimated 187,855 people infected.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1.71%</td>
</tr>
<tr>
<td>&lt;40</td>
<td>0.12%</td>
</tr>
<tr>
<td>40-59</td>
<td>0.28%</td>
</tr>
<tr>
<td>≥60</td>
<td>0.59%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Race</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>0.10%</td>
</tr>
<tr>
<td>Non-White</td>
<td>0.18%</td>
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</table>

<table>
<thead>
<tr>
<th>Sex</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0.29%</td>
</tr>
<tr>
<td>Female</td>
<td>0.19%</td>
</tr>
</tbody>
</table>

Transmission

Mean Incubation Period: 5.2 days
95th Percentile Interval: 12.5 days

Quantifying the Infectious Period

First Patient
- Incubation period
- Symptoms
- Serial Interval

Second Patient
- Incubation period
- Symptoms
- Presymptomatic Transmission
**Distribution of Infectivity**

![Graph showing distribution of infectivity over days after symptom onset.]

- He 2020, Nature Medicine, doi.org/10.1038/s41591-020-0869-5

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**How Contagious Is Covid?**

- **Intensive contact tracing, Ningbo City, China**
  - Amongst 2,147 close contacts of 147 cases
  - 6.2% became infected

- **Secondary attack rates**
  - Household members – 18% developed infection
  - Eating together – 7% developed infection
  - Relatives – 5% developed infection
  - Supermarket – 0.6% developed infection

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**How Contagious is Covid?**

**Intensive contact tracing, Guangzhou, China**

- 3410 close contacts of 391 Covid patients
- Close contacts identified by interview and cell phone tracing
- 127/3410 contacts infected (3.7%)

- **Secondary attack rates varied by setting:**
  - Household (10.3%)
  - Entertainment venues or workplace (1.3%)
  - Health care settings (1.0%)
  - Public transport (0.1%)

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**Secondary Infection Rates by Days from Symptom Onset**

*Infection rates amongst 2,761 close contacts of 100 patients with confirmed Covid-19 in Taiwan*

- **All Types of Contacts**
  - Days from Symptom Onset
  - Secondary Attack Rate

- **Household + Family Members**
  - Days from Symptom Onset
  - Secondary Attack Rate

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Luo, Ann Intern Med 2020; doi.org/10.7326/M20-2671

Contagiousness (R0)

- Covid-19
- Influenza
- SARS
- Varicella
- Pertussis
- Measles

Sanche, Emerg Infect Dis 2020;26:1470-1477

Influenza Cases – Southern Hemisphere

Secondary Attack Rates by Severity of Illness

Secondary attack rates amongst 3410 close contacts of 391 Covid patients, Guangzhou, China

Luo, Ann Intern Med 2020. doi.org/10.7326/M20-2671

Transmission Rates by Age Group

Infection rates amongst 10,592 household contacts of 3,417 patients with Covid-19 in South Korea

Park, Emerg Infect Dis 2020. doi.org/10.3201/eid2610.201315
Transmission Rates by Age Group

Infection rates amongst 59,073 contacts of 5,706 patients with Covid-19 in South Korea

- Household Contacts
- Non-Household Contacts

Park, Emerg Infect Dis. 2020; doi.org/10.3201/eid2610.201315

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Air Flow Modeling

All infected diners were in one area of the restaurant underneath an air conditioner (attack rate 9/20, 45%).

None of the 68 diners in other areas were infected (attack rate 0/68). None of the 8 waiters infected.

Air conditioner was recirculating “old” air rather than fresh (exhaust vents were closed).

Tracer gas studies confirmed VERY poor ventilation in the affected area of the restaurant (0.7 air changes/hour; hospital standard is ≥6 air changes/hour).

Take home: aerosol transmission possible but under conditions of very poor ventilation.

Face Covering and Mask to Minimise Droplet Dispersion & Aerosolisation

Bahl, Thorax 2020; doi:10.1136/thoraxjnl-2020-215748
Thank You!

For all the lives we touch
Clean hands protect our patients.
Always perform hand hygiene and help others do the same.

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