What have we learned from Covid-19 – the good and the bad and the TB

Diagnostics

- The good
  - Widespread implementation of PCR-based testing
  - Some innovative new technologies
- The bad
  - No point-of-care PCR test
  - Rapid antigen-based testing not widely deployed

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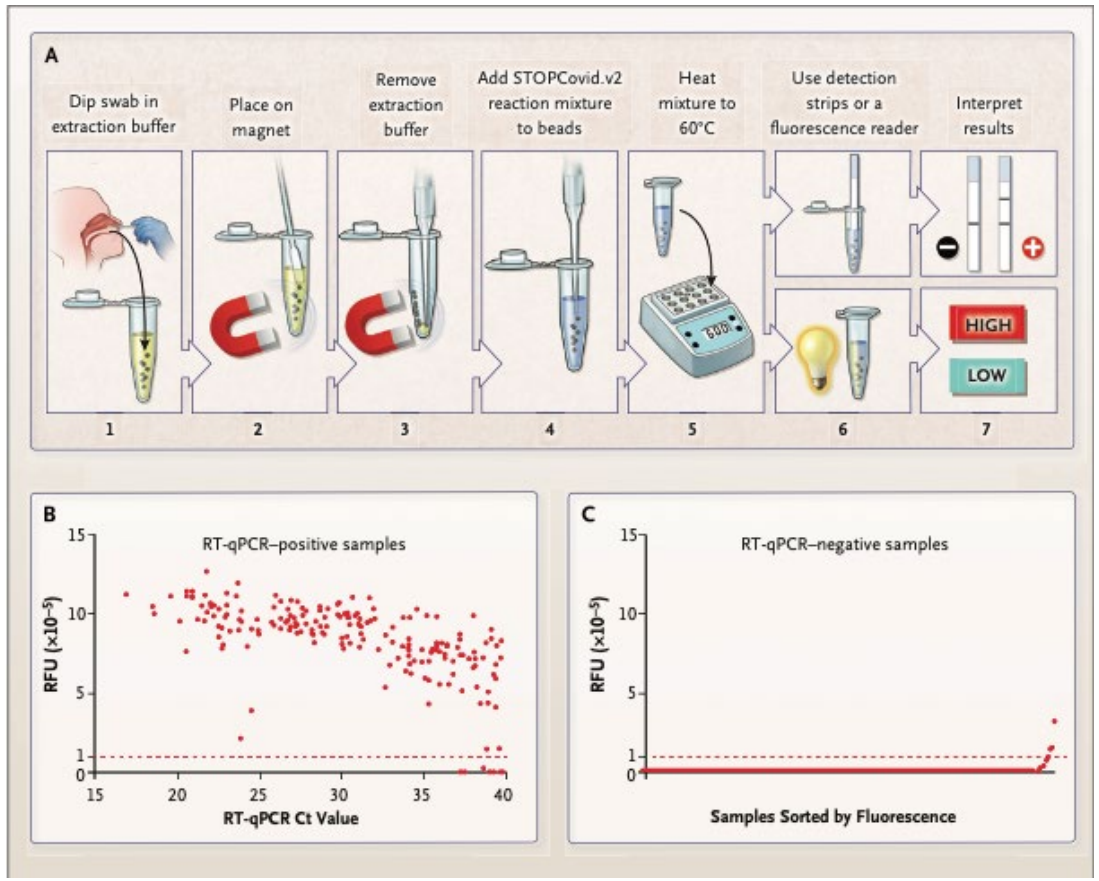
CORRESPONDENCE

Detection of SARS-CoV-2 with SHERLOCK One-Pot Testing



Diagnostics – the lessons for TB

- PCR widely established and available
- Difficult to reduce new technology to practice

Therapeutics

- The good
  - After a slow start, many clinical trials
  - Some success with glucocorticoids and other anti-inflammatories
- The bad
  - No truly new agents
  - No dramatic successes
  - Multiple simultaneous trials with low power to detect differences
  - No real proof-of-concept for antivirals

Showing: 1-100 of **282** studies 100 studies per page

Show/Hide Columns

Row	Saved	Status	Study Title	Conditions	Interventions	Locations
1	☐	Not yet recruiting	Effectiveness of **Hydroxychloroquine** in **Covid-19** Patients	• **COVID19**	• Drug: **Hydroxychloroquine** 200 Mg Oral Tablet • Drug: Azithromycin 500Mg Oral Tablet • Dietary Supplement: Glucose tablets	• Ayub Teaching Institution Abbottābād, K.p.k, Pakistan
2	☐	Withdrawn	**Hydroxychloroquine** in **SARS-CoV-2** (**COVID-19**) Pneumonia Trial	• **SARS-CoV-2** Pneumonia • **COVID-19**	• Drug: **Hydroxychloroquine**	• Kootenai Health Coeur d'Alene, Idaho, United States
3	☐	Withdrawn	Assessing **Hydroxychloroquine** in Patients With **SARS-CoV-2** (**COVID-19**)	• **COVID-19** • **SARS-CoV-2**	• Drug: **Hydroxychloroquine** • Drug: Placebo	• Oregon Health and Science University Portland, Oregon, United States
4	☐	Withdrawn	The University of the Philippines **Hydroxychloroquine** PEP Against **COVID-19** Trial	• **COVID-19**	• Drug: **Hydroxychloroquine** plus standard preventive measures • Drug: Placebo plus standard preventive measures	• Philippine General Hospital - University of the Philippines Manila Manila, Philippines
5	☐	Recruiting	Use of Bromhexine and **Hydroxychloroquine** for Treatment of **COVID-19** Pneumonia	• **Covid-19**	• Drug: Bromhexine Oral Tablet and/or **hydroxychloroquine** tablet	• SB Celje Celje, Slovenia
6	☐	Active, not recruiting	**Hydroxychloroquine** vs. Azithromycin for Hospitalized Patients With Suspected or Confirmed **COVID-19**	• **COVID-19**	• Drug: **Hydroxychloroquine** • Drug: Azithromycin	• Intermountain Medical Center Murray, Utah, United States • University of Utah Salt Lake City, Utah, United States
7	☐	Withdrawn	**Hydroxychloroquine** Azithromycin **COVID-19** Pregnancy Trial	• **COVID19**	• Drug: **Hydroxychloroquine** and azithromycin treatment • Other: conventional management of patients	
8	☐	Terminated	**Hydroxychloroquine** for the Treatment of Mild **COVID-19** Disease	• **COVID-19**	• Drug: **Hydroxychloroquine** • Drug: Placebo	• Institute for Tropical Medicine Tübingen, Germany
9	☐	Not yet recruiting	**Hydroxychloroquine** and Nitazoxanide Combination Therapy for **COVID-19**	• **COVID-19**	• Combination Product: **Hydroxychloroquine** plus Nitazoxanide • Other: Standard care	
10	☐	Recruiting	High-dose **Hydroxychloroquine** for the Treatment of Ambulatory Patients With Mild **COVID-19**	• **COVID-19**	• Drug: **Hydroxychloroquine**	• University of Chicago Chicago, Illinois, United States
11	☐	Terminated	ALBERTA HOPE **COVID-19** for the Prevention of Severe **COVID19** Disease	• **COVID-19**	• Drug: **Hydroxychloroquine**	• University of Calgary/Foothills Medical Centre Calgary, Alberta, Canada • University of Alberta Edmonton, Alberta, Canada
12	☐	Active, not recruiting	**Hydroxychloroquine** Use in Hospitalized Patients With **COVID-19**: Impact on Progression to Severe or Critical Disease	• **COVID-19**	• Drug: **Hydroxychloroquine** • Drug: Placebo	• Wellstar Kennestone Hospital Marietta, Georgia, United States
13	☐	Recruiting	**Hydroxychloroquine** (HCQ) as Post Exposure Prophylaxis (PEP) for Prevention of **COVID-19**	• **Covid19** • **COVID-19** Prevention	• Drug: **Hydroxychloroquine** (HCQ) • Other: Standard care • Other: Placebo	• Post Graduate Institute of Medical Education and Research Chandigarh, India
14	☐	Recruiting	Randomized Placebo-controlled Trial of **Hydroxychloroquine** in Outpatient Cases With **Coronavirus Disease 2019** (**COVID-19**)	• **COVID-19**	• Drug: **Hydroxychloroquine** • Drug: Placebo	• Centro de Pesquisas Clínicas Dr. Marco Mota HCOR Maceió, Alagoas, Brazil • Hospital e Clínica São Roque Ipiaú, Bahia, Brazil • Clínica Otorhinus

Therapeutics – lessons for TB

- Maintaining a drug development pipeline is critical
- Coordinating expensive and lengthy trials across multiple groups is far more efficient

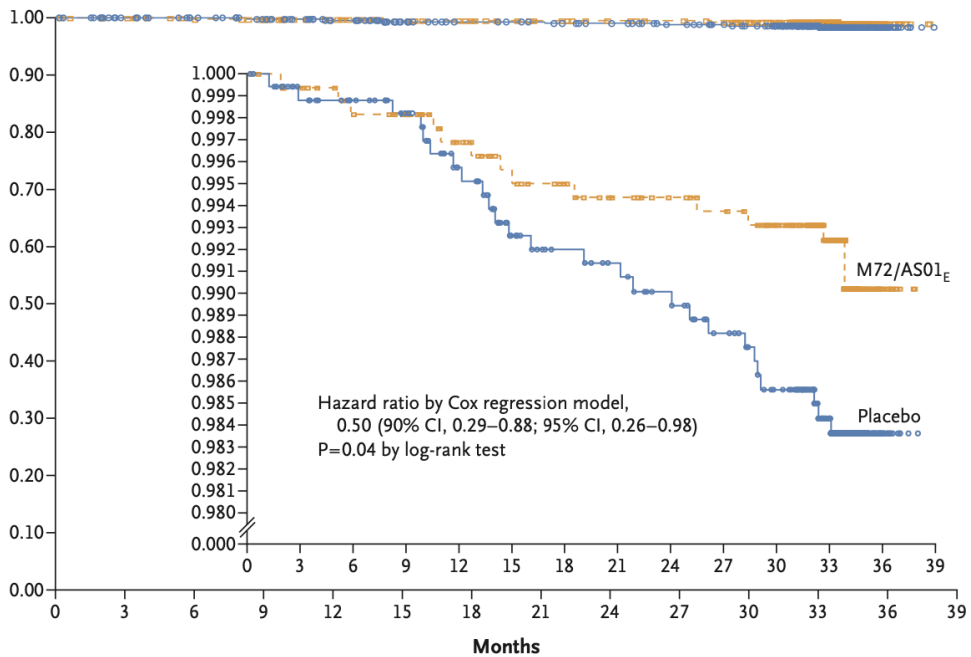
Vaccines

- The good
  - Incredibly rapid development and deployment
  - New technologies that promise rapid development
  - Extensive real-world safety testing for vaccine delivery methods
  - Large RCTs done quickly while maintaining high quality
- The bad
  - We still don’t have a reliable biomarker of vaccine efficacy

ORIGINAL ARTICLE

Final Analysis of a Trial of M72/AS01$_E$ Vaccine to Prevent Tuberculosis

D.R. Tait, M. Hatherill, O. Van Der Meeren, A.M. Ginsberg, E. Van Brakel, B. Salaun, T.J. Scriba, E.J. Akite, H.M. Ayles, A. Bollaerts, M.-A. Demoitié, A. Diacon, T.G. Evans, P. Gillard, E. Hellström, J.C. Innes, M. Lempicki, M. Malahleha, N. Martinson, D. Mesia Vela, M. Muyoyeta, V. Nduba, T.G. Pascal, M. Tameris, F. Thienemann, R.J. Wilkinson, and F. Roman



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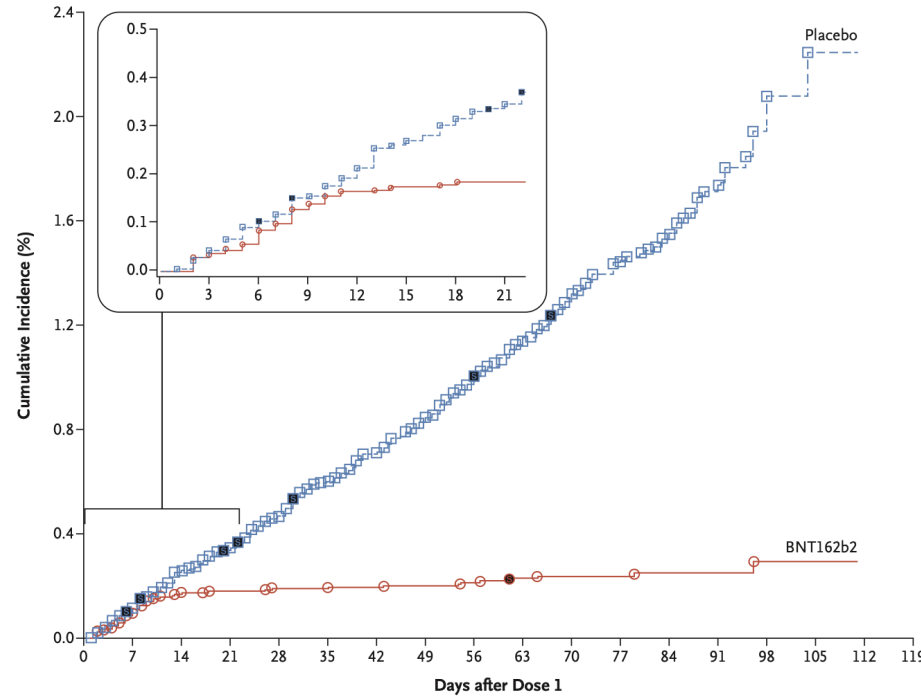
Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine

Fernando P. Polack, M.D., Stephen J. Thomas, M.D., Nicholas Kitchin, M.D., Judith Absalon, M.D., Alejandra Gurtman, M.D., Stephen Lockhart, D.M., John L. Perez, M.D., Gonzalo Pérez Marc, M.D., Edson D. Moreira, M.D., Cristiano Zerbini, M.D., Ruth Bailey, B.Sc., Kena A. Swanson, Ph.D., Satrajit Roychoudhury, Ph.D., Kenneth Koury, Ph.D., Ping Li, Ph.D., Warren V. Kalina, Ph.D., David Cooper, Ph.D., Robert W. Frenck, Jr., M.D., Laura L. Hammitt, M.D., Özlem Türeci, M.D., Haylene Nell, M.D., Axel Schaefer, M.D., Serhat Ünal, M.D., Dina B. Tresnan, D.V.M., Ph.D., Susan Mather, M.D., Philip R. Dormitzer, M.D., Ph.D., Uğur Şahin, M.D., Kathrin U. Jansen, Ph.D., and William C. Gruber, M.D., for the C4591001 Clinical Trial Group*



Vaccines – the lessons for TB

- mRNA (and, possibly, adenovirus vectors) provides a rapid way to test new antigens without adjuvants with limited availability
- Without biomarkers or new and persuasive models, there is still no substitute for large phase 3 trials