The social role of C-reactive protein point-of-care testing to guide antibiotic prescription in Northern Thailand

Febrile illness: a unified approach to protocol design for multicentered studies

Dr Marco J Haenssgen | 22 Jan 2019 | Annecy | Session 2: Fever – The Research Landscape

University of Oxford | Cabdyn Complexity Centre | Said Business School | Nuffield Department of Medicine | AMR Tackling Antimicrobial Resistance | ESRC Economic & Social Research Council | GCRF Global Challenges Research Fund | Warwick The University of Warwick

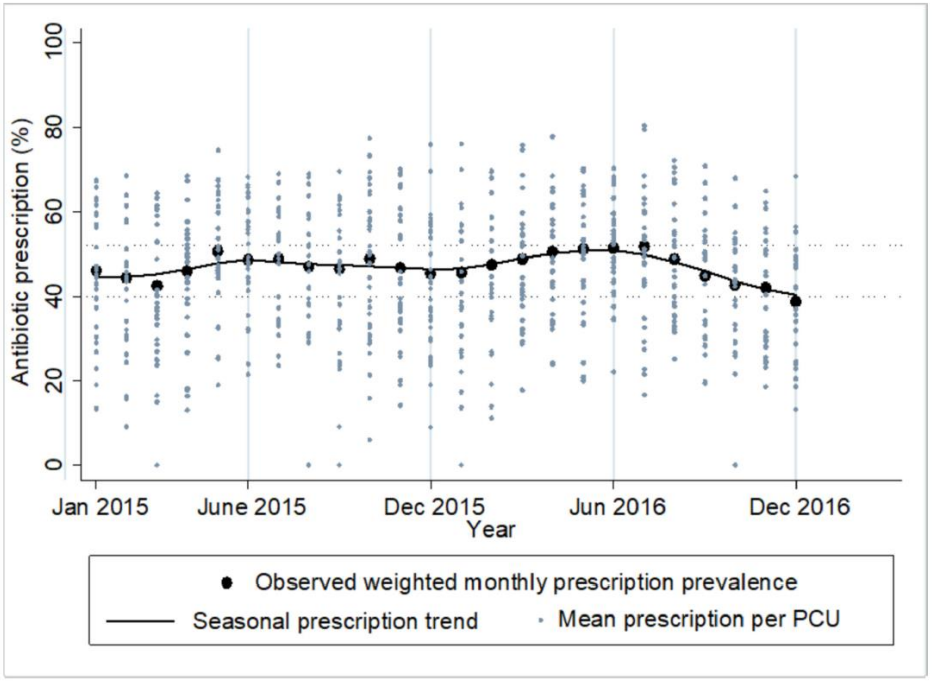

Figure 3 Trend and seasonality of antibiotic prescriptions overlaid by mean antibiotic prescription rates per primary care unit (PCU).

Motivation

High (though mixed) antibiotic use in Southeast Asia

Few options to diagnose **non-malaria fevers** in LMICs

Rapid point-of-care diagnostics to **support clinical decision**

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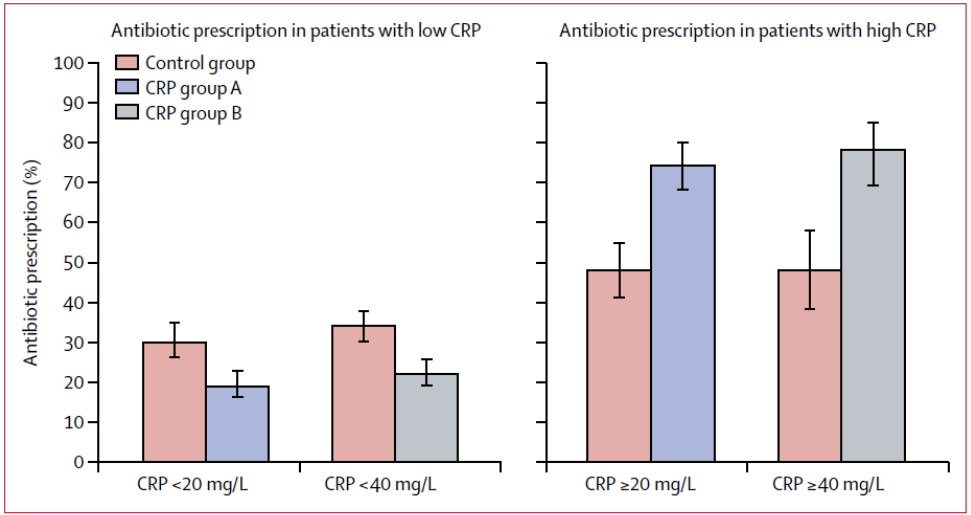

Figure 3: **Antibiotic prescription on day 0 in relation to the CRP thresholds in each of the intervention groups for all age categories and countries**

Error bars represent 95% CI. CRP=C-reactive protein.

The Clinical Trials

Introduction of CRP POCT on **primary care level**

Total of **2,410 fever patients** in **Chiang Rai** and **Myanmar**

Mildly improved **targeting** and **reduction** of AB prescription

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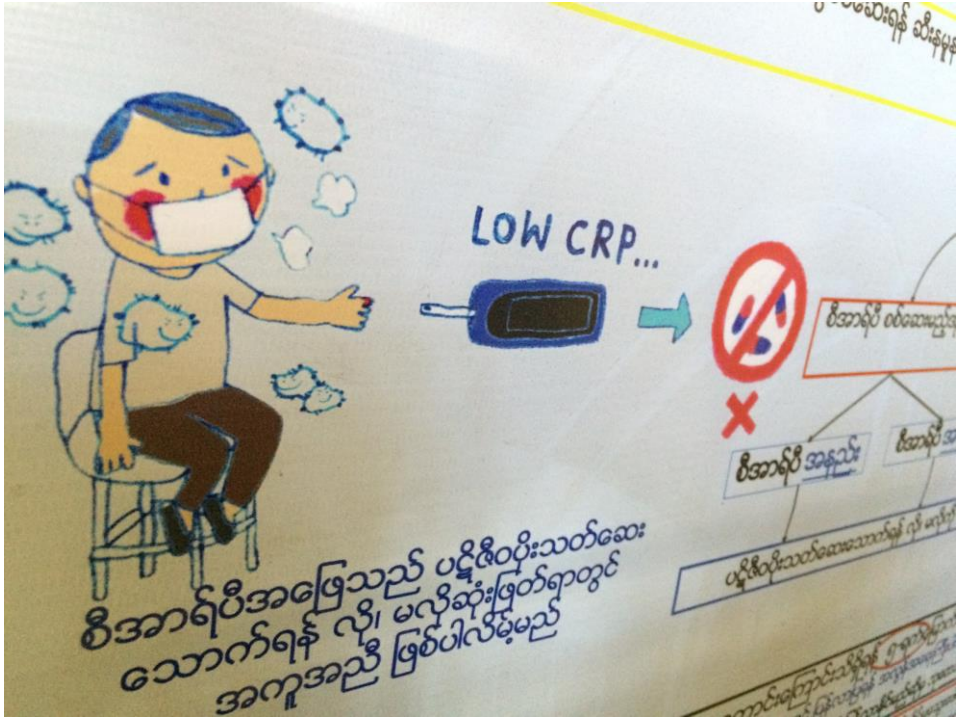

Parallel Social Research

Understand **implementation context** of CRP POCT trials

Interviews and FGDs with patients and healthcare staff

84:35hrs audio records (=**936,000 words** written material) from **92 participants**

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Related Research Papers

- Haenssgen, MJ, Charoenboon, N, Althaus, T, Greer, RC, Intralawan, D *et al.* (2018). The social role of C-reactive protein point-of-care testing to guide antibiotic prescription in northern Thailand. *Social Science & Medicine, 202,* 1-12. doi: 10.1016/j.socscimed.2018.02.018
- Khine Zaw, Y, Charoenboon, N, Haenssgen, MJ & Lubell, Y (2018). A comparison of patients' local conceptions of illness and medicines in the context of C-reactive protein biomarker testing in Chiang Rai and Yangon. *American Journal of Tropical Medicine and Hygiene, 98*(6), 1661-1760. doi: 10.4269/ajtmh.17-0906
- Althaus, T, Greer, RC, Swe, MMM, Cohen, J, Tun, NN *et al.* (2019). Effect of point-of-care C-reactive protein testing on antibiotic prescription in febrile patients attending primary care in Thailand and Myanmar: an open-label, randomised, controlled trial. *The Lancet Global Health, 7*(1), e119-e131. doi: 10.1016/S2214-109X(18)30444-3
- Haenssgen, MJ, Charoenboon, N, Zanello, G, Mayxay, M, Reed-Tsochas, F *et al.* (2018). Antibiotics and activity spaces: protocol of an exploratory study of behaviour, marginalisation, and knowledge diffusion. *BMJ Global Health, 3*(e000621). doi: 10.1136/bmjgh-2017-000621
- Haenssgen, MJ, Charoenboon, N, Thuy, NDT, Althaus, T, Khine Zaw, Y *et al.* (under review). How Context can Impact Clinical Trials: A Multi-Country Qualitative Case Study Comparison of Diagnostic Biomarker Test Interventions. *Trials.*

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English	Thai	Explanation
"Antibiotic"	***ยาปฏิชีวนะ*** (*"yah pa ti chee wa na"*)	Technical term with Pali roots, rarely used (e.g. higher education levels); linked to varied modes of use, e.g. sole dependence on doctors' advice as well as self-medication for sore throat
"Anti-inflammatory drug"	***ยาแก้อักเสบ*** (*"yah kae ak seb"*)	Common vernacular expression of antibiotics; sometimes referring to anti-inflammatory drugs; often linked to sore throat, muscle pain, wounds, acne
"Microbe / germ killer"	***ยาฆ่าเชื้อ*** (*"yah kah chuea"*)	Vernacular description of antibiotics; may also include e.g. stomach medicine or rubbing alcohol; linked to wide range of illnesses including fever in some instances
"Sore throat medication"	***ยาแก้เจ็บคอ*** (*"yah kae jeb koh"*)	Vernacular description linked to sore throat as commonly treated symptom; can also refer to cough medicine/drops
"Amoxicillin"	***แอมม็อกซี่*** (*"amoxy"*)	Vernacular expression of antibiotics as uttered literally, specific reference to antibiotics but relatively uncommon (e.g. higher education, healthcare workers); uses similar to *yah pa ti chee wa na*
"Medicine that relieves the pain"	[no local language equivalent of Thai "antibiotic" or "anti-inflammatory drug"]	Description of antibiotics without local language equivalent (e.g. Akha, Lahu); linked esp. to use for muscle pain

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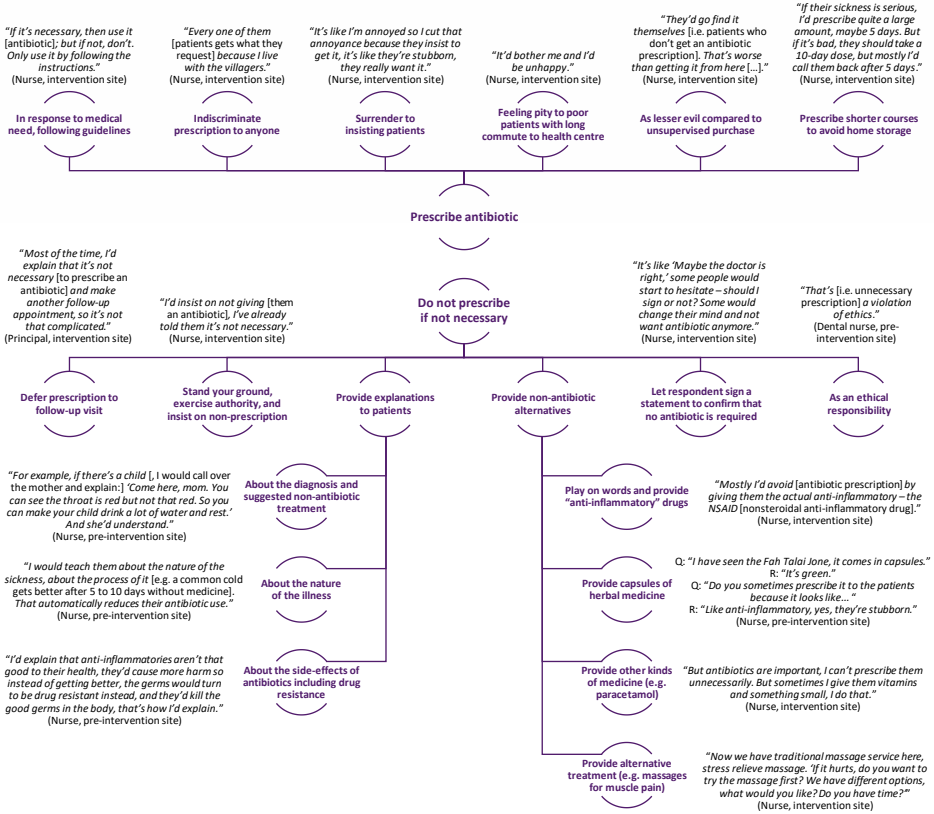
Main Results

1. **AB conceptions ≠ CRP assumptions**



*Q: "I have seen the **Fah Talai Jone**, it comes in capsules."*
R: "It's green."
Q: "Do you sometimes prescribe it to the patients because it looks like... "
R: "Like anti-inflammatory, yes, they're stubborn."

*"Every one of them [patients gets what they request] **because I live with the villagers**."*

*"That's [i.e. unnecessary prescription] a **violation of ethics**."*

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Main Results

1. AB conceptions ≠ CRP assumptions
2. Tactics & ethical dilemmas in AB prescription

	Intended / Anticipated	Unintended
Positive	Support **targeting** of antibiotic prescriptions **Diagnostic aid** for HCW **Additional (external) tool** for HCW to convince patient of non-prescription CRP POCT **reinforces patient trust** in HCW decisions	Elevate **status** of primary care facilities Complement restrictive antibiotic prescription policy regime as an **allocative decision-making tool** Increase **patient trust** in public health system through: • perception as **comprehensive blood test**, • "**performance**" of testing, and • **circumvention** of HCW uncertainty
Negative	Shifts in **prescription patterns** to compensate for patient demands Senior HCWs continue to base decisions **on experience, not on CRP POCT** Clinics and pharmacies **absorb antibiotic demand** for patients who test negative for CRP in public primary care settings	HCWs **evade compliance** through private treatment and distributing prescriptions Patient compliance depends on **complementary** (information on) non-antibiotic **solutions** Increasingly **risky health behaviours** through patient reassurance by seemingly "comprehensive blood test"

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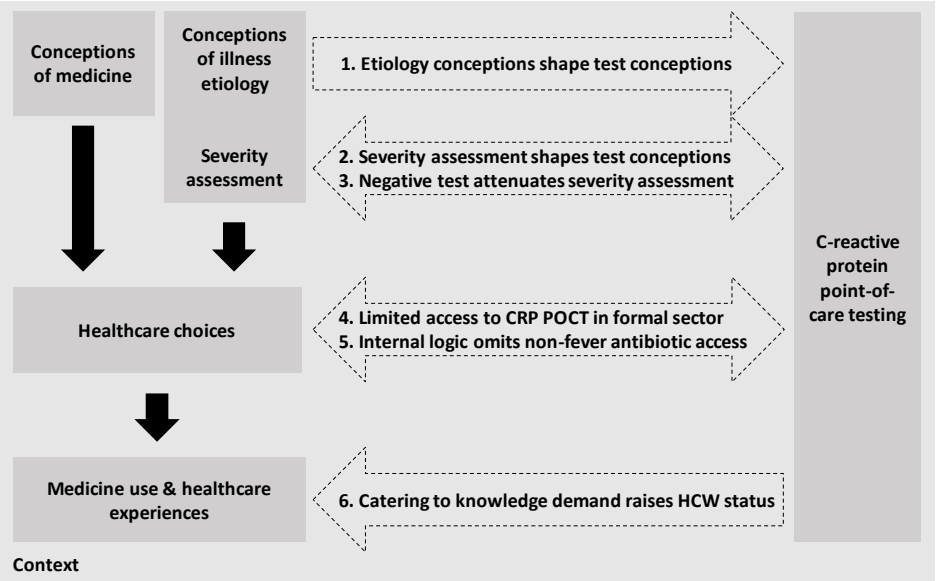
Main Results

1. AB conceptions ≠ CRP assumptions
2. Tactics & ethical dilemmas in AB prescription
3. **Unintended consequences**



*"patients [...] appeared to associate the test with **serious specific conditions**"*

*"patients in both sites were '**relieved**' or '**happy**' when tested negative"*

Outlook (related research)

Local knowledge influences implementation of CRP POCT

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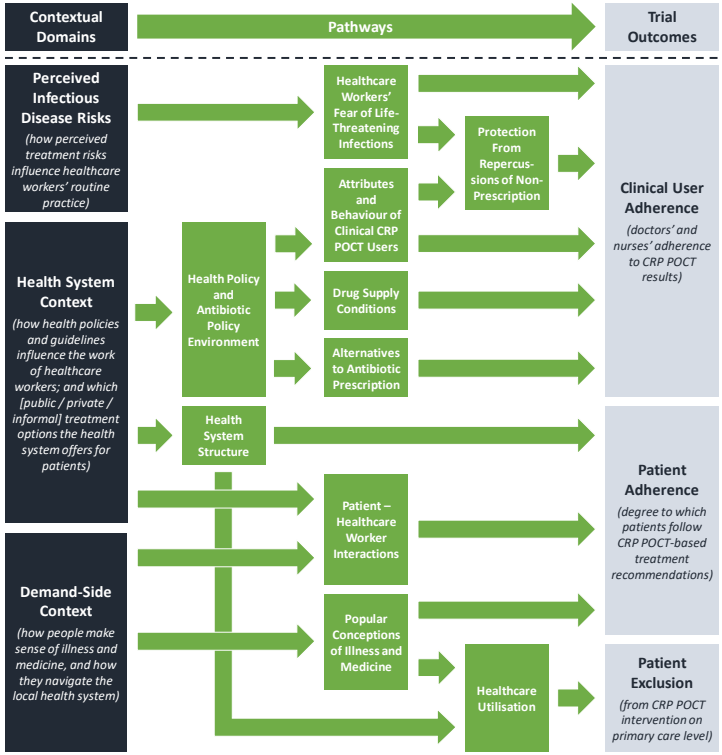

"A CRP POCT trial implemented without a complementary policy environment or out of sync with local expectations for antibiotic use may yield less significant findings than otherwise, which could hinder the pursuit of further research in single-site trials ***unless the source of the contextual impact is clear****. Likewise, trial* ***results could appear positive yet emerge as unsustainable*** *in routine practice if healthcare workers reverted to their accustomed behaviours during the workload-intensive monsoon season."*

Outlook (related research)

Local knowledge influences implementation of CRP POCT

Clinical intervention trials are subject to **contextual influences**

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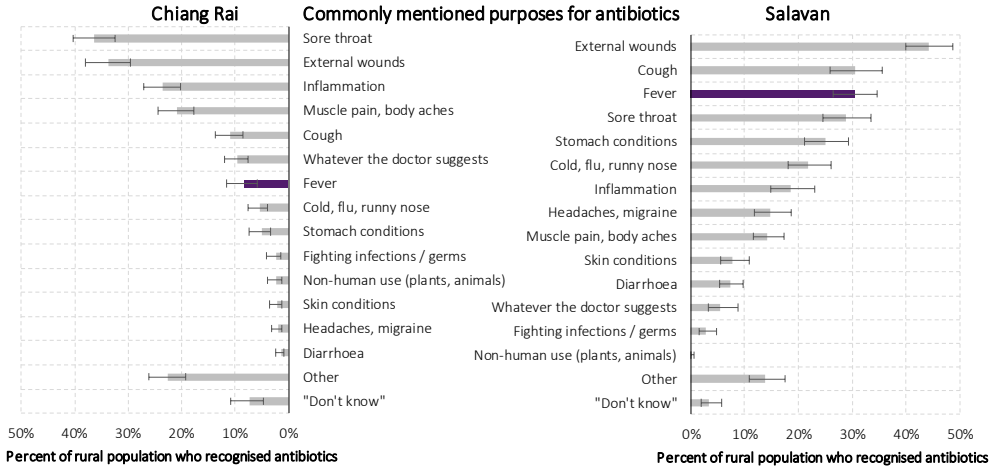

"The most common use was the treatment of external wounds (Chiang Rai: 33.7%; Salavan: 44.4%; p<0.001). Other frequently reported uses in Salavan included coughs (30.5%; Chiang Rai: 10.9%; p<0.001) and ***fevers (30.5%; Chiang Rai: 8.3%; p<0.001)****."*

Outlook (related research)

Local knowledge influences implementation of CRP POCT

Clinical intervention trials are subject to **contextual influences**

Understand the role of fever in **treatment-seeking patterns**

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Conclusion: What do we learn about clinical management of fever?

Clinical trials require social research to understand context and consequences.

- Design locally **appropriate interventions** and **interpret quantitative indicators** more effectively
- Understand how **contextual factors** influence adherence of patients and healthcare staff
- Document unforeseen **social consequences** and population-level impacts outside clinical setting

CRP point-of-care tests have social consequences similar to malaria RDTs.

- CRP POCT entailed **improved AB targeting** but requires **conducive policy environment**
- **Misunderstood purpose** encourages patient adherence and potentially risky behaviour
- Extension of selective tests **increase status** of private providers and **legitimise** informal providers

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Summary

- Fever-related treatment seeking is context specific
- Interventions may succeed for the wrong reasons and with problematic side-effects
- Complement clinical research with social sciences early on

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Thank you.

marco.haenssgen@warwick.ac.uk
Twitter: @HaenssgenJ

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