

IUCN BSG



Guidelines for Field Hygiene: Origins, challenges, and adoption

Julie Teresa Shapiro, Kendra Phelps, Paul Racey, Amanda Vicente-Santos,
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OneBAT Training on Bat Sanitary Surveillance

May 21, 2026

CALL FOR MEMBERS: WORKING GROUP ON HUMAN-BAT TRANSMISSION OF SARS-COV-2: RISKS AND RECOMMENDATIONS



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Mon, Apr 20, 2020, 8:42 PM



*From: **Dr Tigga KINGSTON***

*To: **IUCN SSC Bat Specialist Group 2017-2020***

Dear BSG Members

Following the

recommendation for the suspension of field research, we are assembling a Working Group to evaluate the magnitude of risk and make more detailed recommendations for bat researchers as well as non-research stakeholders at the human-bat interface (e.g. rehab facilities, zoos). The Working Group should draw on its own expertise, reach out beyond the BSG for expert opinion, consider the outcomes of infectivity, pathology and transmission trials as they become available, and interface with on-going efforts, most notably the risk assessment of the USGS and other working groups (EUROBATS). The Working Group will develop recommendations in light of the global constituency of the BSG and attendant variability in resources for risk mitigation (e.g. PPE). BSG members with expertise in bat-borne viruses are needed, but representation of all aspects of bat research and geographical coverage is desired. We are aiming for a core Group about 10-15 members.

Please email Tigga (tigga.kingston@ttu.edu) if you can serve.

Thank you everyone



Bat One Health WG

Brokers between disease and conservation communities.

Luis Viquez-R, Stefania Leopardi, Amanda Vicente-Santos, Wanda Markotter, Ian H. Mendenhall, Winifred F Frick, Rebekah C Kading, Rodrigo A. Medellín, Paul Racey, Lisa Worledge, Danilo Russo, Andrez Kepel, Jenny Mclean, Tracey Jolliffe, Isabella Mandl, Kendra Phelps, Luz de Wit, Vu Dinh Thong, Lourdes Berenice Gómez Estrada, Fátima Tec Pool, Iliana Tiburcio Sánchez, Stuart Parsons, Ally Walsh, Maya Weinberg, Marinda Mortlock, Marike Geldenhuys, Hannah Eiseman, Alexa Sadier, Malik Oedin, Parfait Palamanga Thiombiano, Sigit Wiantoro, Tigga Kingston

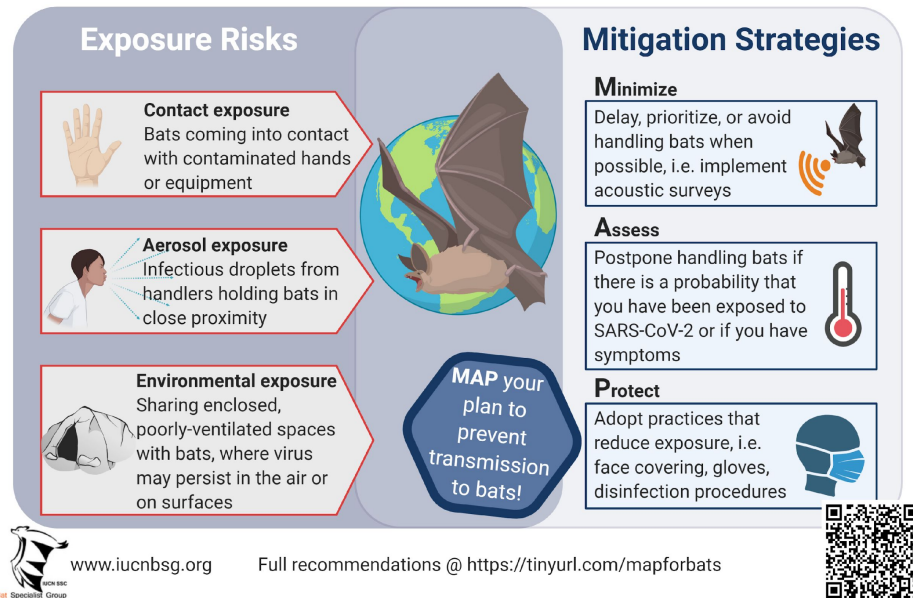
IUCN SSC Bat Specialist Group (BSG) Recommended Strategy for Researchers to Reduce the Risk of Transmission of SARS-CoV-2 from Humans to Bats

MAP: Minimize, Assess, Protect

Living Document Version 1.0 Released 19th June 2020

Authors: Germán Botto Nuñez, Andrew Cunningham, Eric Moise Bakwo Fils, Winfred Frick, Md Nurul Islam, Tracey Jolliffe, Rebekah Kading, Andrzej Kepel, Tigga Kingston, Stefania Leopardi, Rodrigo Medellín, Ian Mendenhall, Stuart Parsons, Paul Racey, Danilo Russo, Julie Teresa Shapiro, Amanda Vicente-Santos, Luis Viquez-R, Thong Vu Dinh

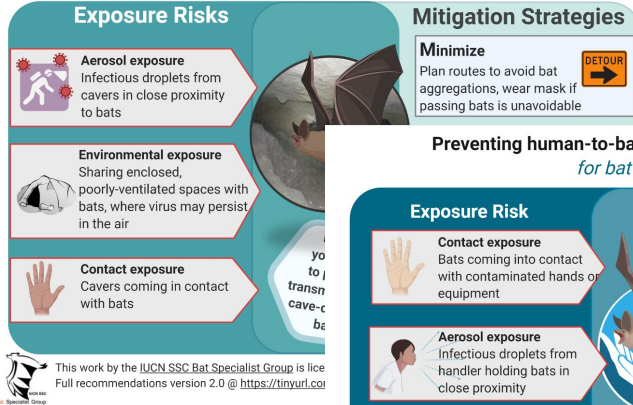
Preventing human-to-bat transmission of SARS-CoV-2



Version 1.0 in 2020 - Version 2.0 (2022)

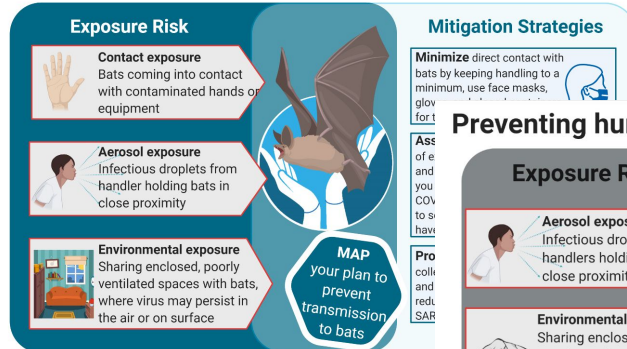
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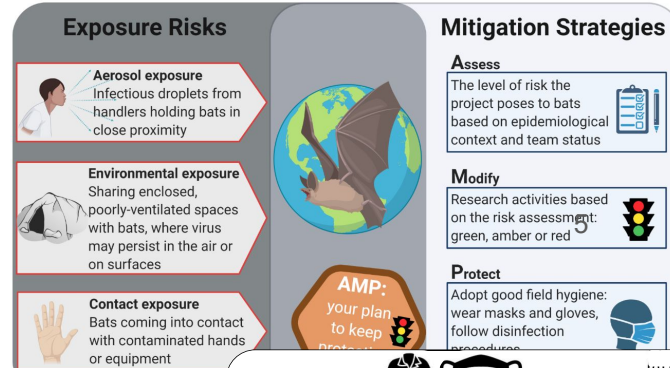
Preventing human-to-bat transmission of SARS-CoV-2

for bat rehabilitation

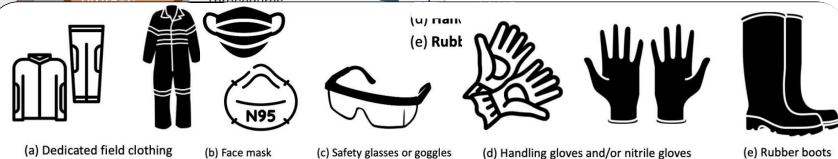


www.iucnbsg.org Complete recommendations @ <https://tinyurl.com/iucnbat>

Preventing human-to-bat transmission of SARS-CoV-2



- Significant deviation from previous norms
- Especially for non-disease researchers



What should we be doing outside the pandemic context?





What is Field Hygiene?

Set of best practices using standard, simple measures to minimize the risk that research activities result in **pathogen pollution**, the human-facilitated moving or transferring of pathogens between species and sites



Diego Peralta

Why do we researchers need to adopt field hygiene?



Change our practices to protect bats **AND** people

People → Bats

Bats → People

Bats → Bats (mediated by people)



Need to self-regulate

Global politics re: biosafety

- Risk imposition of unsuitable regulations

A chance to do things in a better way

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A chance to do things in a better way

→ *Bat researchers are increasingly taking bio-samples from bats for a range of questions unrelated to pathogen research (e.g., diet, microbiome, stress hormones, transcriptomes)*

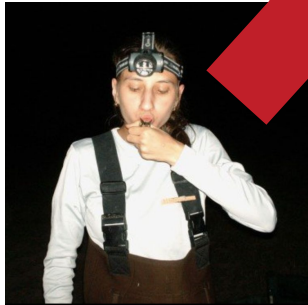
Improving Field Hygiene (biosafety) to Mitigate Pathogen Pollution and Wildlife-Human Spillover

Opportunity to change behaviors and promote best practices to reduce bi-directional transmission of potential pathogens

→ Provide a tool to empower researchers to assess risk and plan accordingly

Main behavioral changes:

- No bats near face
- No more blowing on bats
- Don't eat, drink, smoke around bats
- Wear basic PPE, adjust to context
- PLAN for field hygiene and safety



Improving Field Hygiene (biosafety) to Mitigate Pathogen Pollution and Wildlife-Human Spillover

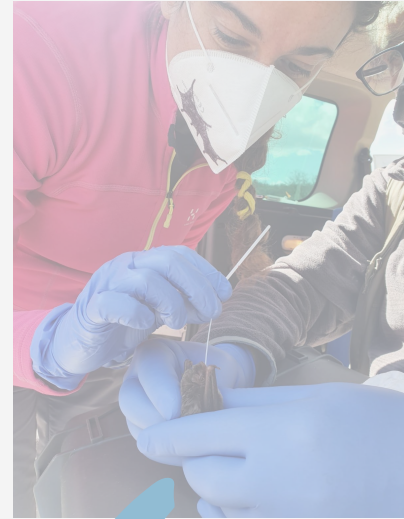
Opportunity to change behaviors and promote best practices to reduce bi-directional transmission of potential pathogens

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**TARGET AUDIENCE – FIELD RESEARCHERS
NOT SPECIFICALLY ENGAGED IN DISEASE
ECOLOGY OR PATHOGEN RESEARCH**



Challenges

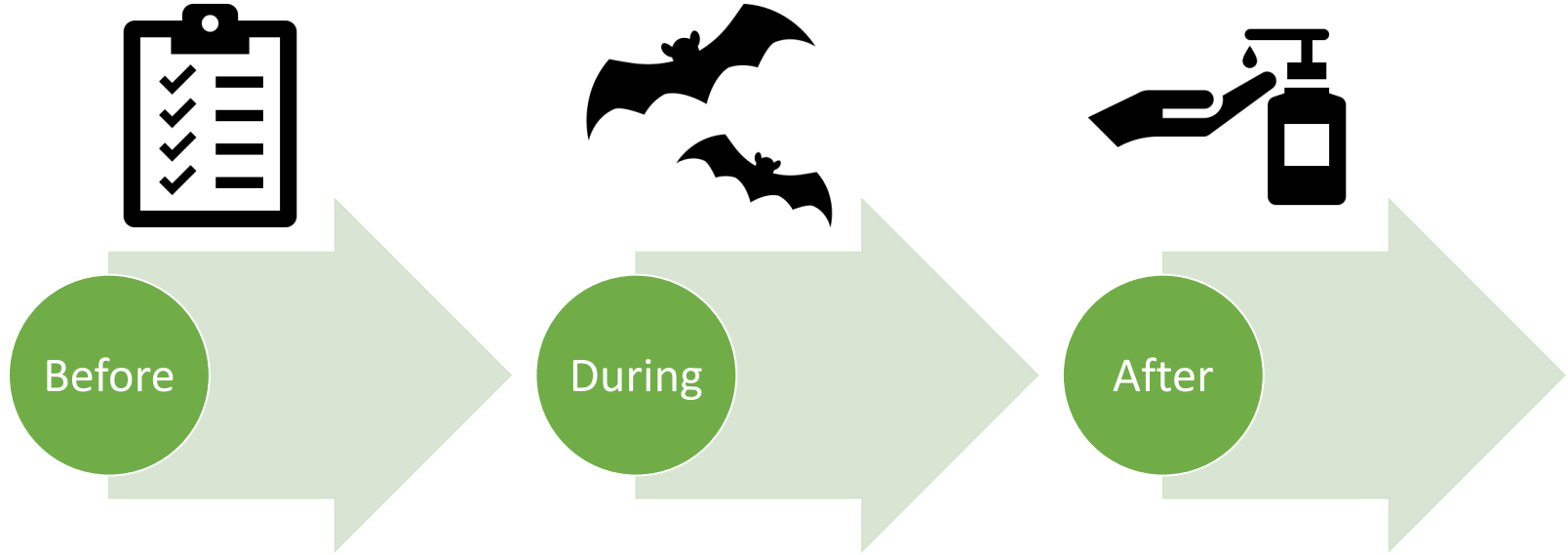
- Developing guidelines for a **global constituency**
 - Diverse bat species (>1500)
 - Diverse microbes with differing pathogen potential
 - Availability of guidance varies (countries lacking IACUC/Biosafety governance).
 - Access to PPE varies
 - Remote fieldwork

Challenges

- Developing guidelines for a **global constituency**
- The role of bats as reservoirs of potential pathogens and use of PPE are **very emotive** issue among bat researchers
 - Challenges long-held beliefs and practices
 - Fear / image of bats, especially in anthropogenic areas



Manual-like layout



Manual-like layout: cautions, tips, graphics/photos

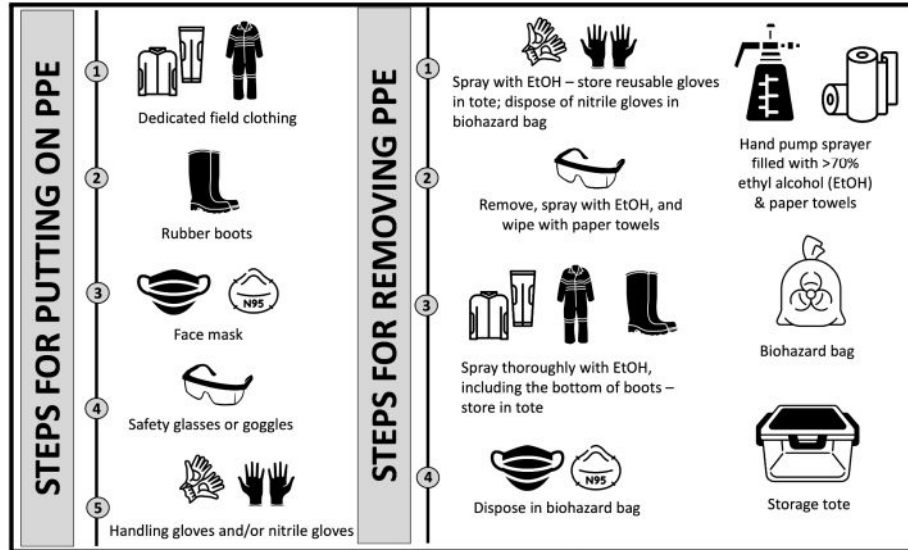


Figure 2. Ordered steps for putting on personal protective equipment (PPE) - donning - and removal of PPE - doffing, including disinfection and disposal protocols for PPE.

TIPS: PPE

- Wear weather-appropriate street clothing under dedicated field clothing
- Well-fitting facemasks and well-fitting eyewear will prevent fogging of eyewear
- Additional measures to prevent fogging include smearing a thick layer of defogging solution, baby shampoo, or dishwashing detergent inside the eyewear
- Handling gloves and / or nitrile gloves should be well-fitting to maintain dexterity

Things not to do:

- Do not eat, drink, or smoke while wearing PPE, near bats, or on the same surfaces or spaces where you are handling bats.
- Avoid using phones, cameras, laptop computers or tablets or any other hand-held electronics while wearing PPE, unless they can be disinfected following protocols for all other equipment.

Note that the risk of microbe transmission to or from bats can never be reduced to zero; our goal is to reduce this risk as much as practically possible by providing barriers to primary routes of transmission, regular use of disinfectants, and changing fieldwork behaviors.

Process:



Before

During

After

Step 0: Permits & vaccinations.

Step 1: Evaluate risks based on: (1) geographic region; (2) bat species; (3) research activities

Step 2: Select appropriate Personal Protective Equipment (PPE).

Step 3: Prepare PPE and Field Safety Plan

Step 4: Train all personnel in PPE use and the Field Safety and Hygiene Plan.

PPE: Basic

For ALL capture / close proximity:

- **Dedicated field clothes**
- **Masks**
- **Gloves**
- **Dedicated Footwear**
- Optional: Eyewear

- 1 bat 1 bag
- No eating/drinking/smoking in proximity
- Disinfection protocols



PPE: Basic

For ALL capture / close proximity:

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- **Optional: Eyewear**

- 1 bat 1 bag
- No eating/drinking/smoking in proximity
- Disinfection protocols



PPE: Basic+ (activities with greater transmission risk)

For higher risk activities:

- **Disposable / disinfectable clothing**
- **Fitted Masks / Respirators**
- **Gloves**
- **Dedicated Footwear**
- **Eyewear**



Preparing specimens, taking blood or tissue samples
Entering caves etc

Process:



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During

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Step 4: Train all personnel in PPE use and the Field Safety and Hygiene Plan.

Step 0: Check team health and readiness before each night.

Step 1: Establish separated working spaces for living (if camping/eating) and working with bats.

Step 2: Prepare the processing station(s).

Step 3: Bat collection.

Step 4: Bat processing.

Step 5: Bat release.

Step 6: Lab space cleaning and breakdown.

Processing Station Set-Up



Figure 4. Example processing station set-up with standard supplies needed to collect samples from captured bats, including disinfectants and biohazard waste disposal (i.e., sharps container and biohazard bags).

Process:



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Disinfect all equipment and clothes

Properly dispose of biohazard waste and sharps.

Stay in contact with all team members and monitor team health.

IUCN SSC BAT SPECIALIST GROUP

GUIDELINES FOR FIELD HYGIENE

Authors: Julie Teresa Shapiro, Kendra Phelps, Paul Racey, Amanda Vicente-Santos, Luis Viquez-R, Allyson Walsh, Maya Weinberg, Tigga Kingston

Reviewers: Joanna L. Coleman, Winifred F. Frick, Luz A. de Wit, Stefania Leopardi, Wanda Markotter, Sasan Fereidouni, Rebekah C. Kading, Olivier Reynard, Vu Dinh Thong



But will field researchers adopt
FIELD HYGIENE measures?

CONTRIBUTED PAPER

Conservation Biology



Drivers of bat researchers' intent to adopt field hygiene practices

Joanna L. Coleman^{1,2,3}  | Ewan A. Macdonald^{1,4}  | Abigail L. Rutrough^{1,5}  |
Tanja M. Straka^{1,6}  | Todd D. Little⁷  | Zachary Stickley⁸  | Tigga Kingston^{1,5,9} 

- Qualitative survey ~200 researchers
- Global quantitative survey ~1000

Field Hygiene Indicators

General intent



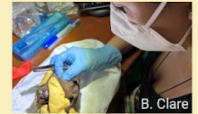
Disinfect tools

One bat per bag

Clean bags
between uses

Not blow on bats

Not eat and drink

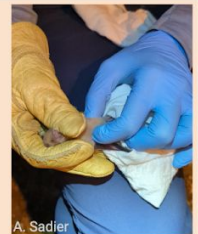


Disposable gloves

N95 type masks

Dedicated field
clothes

Protective gloves



Covid-19

Rabies pre-
exposureRabies post-
exposure

What influences the adoption of Field Hygiene?

→ *Theory of planned behavior*

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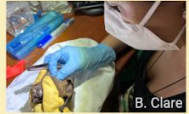
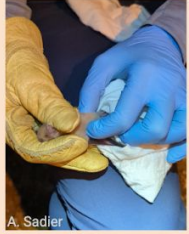
Rabies post-
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What influences the adoption of Field Hygiene?

→ *Theory of planned behavior*

- **Subjective norm**
 - What are the people around me doing?
- **Perceived behavioral control**
 - How easy or difficult is it to perform the behavior

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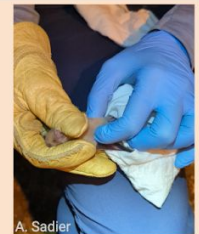


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Field Hygiene Indicators

General intent



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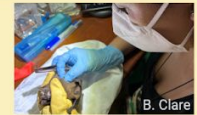
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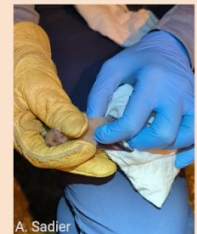


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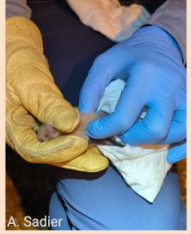
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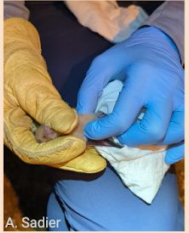
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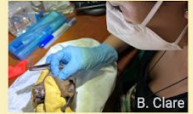
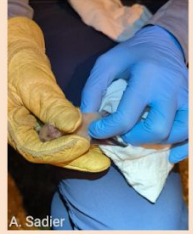
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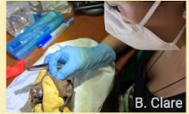
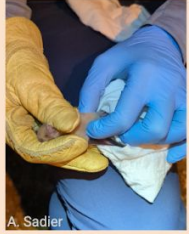
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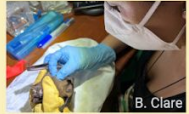
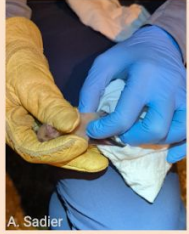
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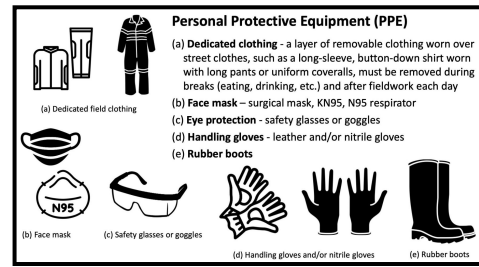
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- ✗ Socio-economic status
 - No difference between low and high socioeconomic status regions
 - Impracticality and discomfort seen as greater barriers by researchers in high SES locations

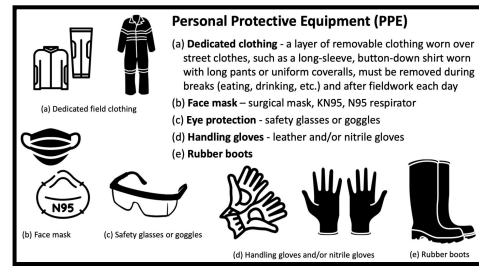
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Take-home message on Field Hygiene & Adoption



- Comprehensive guidelines for bat field hygiene available
 - Written by interdisciplinary team responsive to both challenges of field work and risks of multi-directional pathogen transmission
- Positive feedback especially from researchers in Global South
 - Less onerous than government recommendations
 - Adapted to actual field conditions
- Critical to engage senior career researchers
 - Only group in which attitude played a role (least likely to adopt)
 - They are the mentors that influence subjective norm
- Divide between disease and non-disease researchers

Practical tips for Field Hygiene & Adoption



- Plan ahead!
 - Don't try to buy all the PPE a week before field work
 - Proper sizes / fit reduces discomfort
- Emphasize mitigations of discomfort and impracticality (fit –gloves, masks, eyeware; defogging)
- Explain what you're doing / why using PPE in "public" study areas

Thank you!





Bat One Health WG

Our Vision: A world with science-based understanding of the connections between the health of bats, people and ecosystems.

Our Mission: To advance multidisciplinary integrative research and informed communication to promote bat conservation as essential to one health.

Est. 2020 in response to SARS-CoV-2