DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

March 18, 2021

SENT VIA EMAIL

Melanie Sloan
American Oversight
1030 15th Street NW
Suite B255
Washington, District of Columbia 20005
foia@americanoversight.org

Dear Ms. Sloan:

This letter is our final response regarding your Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry (CDC/ATSDR) Freedom of Information Act (FOIA) request of April 2, 2020, assigned #20-01138-FOIA, for:

> [a]ll materials prepared or compiled by officials at your agency or through an interagency process for Jared Kushner, senior advisor to the President, regarding the coronavirus outbreak and the risk of its spread (or any efforts or opportunities to mitigate its spread).
>
> This request includes, but is not limited to, all materials requested or tasked by Mr. Kushner regarding the coronavirus outbreak; all final talking points prepared for briefings of Mr. Kushner on the coronavirus outbreak; all updates or recommendations for Mr. Kushner regarding the outbreak and efforts to mitigate its spread; and all finished intelligence products (including any other final intelligence articles, assessments, or memoranda, or any final daily updates or situation reports for your agency's senior leadership) prepared by analysts at your agency or through an interagency process and provided to Mr. Kushner regarding the coronavirus outbreak and the risk of its spread (or any efforts or opportunities to mitigate its spread).
>
> Please provide all responsive records (includes attachments) from December 1, 2019 through March 31, 2020. See attached.

We received your response to our letter dated June 5, 2020, in which you stated the following:

> American Oversight respectfully disagrees that the request is improper. We have described our request with specificity --- we seek CDC records of materials prepared or compiled for White House Senior Advisor Jared Kushner regarding the coronavirus outbreak and the risk of its spread, between December 1, 2019 and March 31, 2020. . . see attached.

We located 88 pages of responsive records (35 pages released in full; 19 pages released in part; 34 pages withheld in full). After a careful review of these pages, some information was withheld from release pursuant to 5 U.S.C. §552 Exemptions 5 and 6.

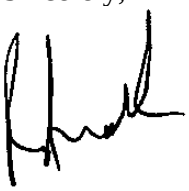
Exemption 5 protects inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency. Exemption 5 therefore incorporates the privileges that protect materials from discovery in litigation, including the deliberative process, attorney work-product, and attorney-client privileges. Information withheld under this exemption was protected under the deliberative process and presidential communications privileges. The deliberative process privilege protects the decision-making process of government agencies. The deliberative process privilege protects materials that are both predecisional and deliberative. The information that have been withheld under the deliberative process privilege of Exemption 5 are both predecisional and deliberative, and do not represent formal or informal agency policies or decisions. Examples of information withheld include recommendations, comments, opinions. The presidential communications privilege protects documents solicited and received by the President or his immediate White House advisers who have broad and significant responsibility for investigating and formulating the advice to be given to the President.

Exemption 6 protects information in personnel and medical files and similar files when disclosure would constitute a clearly unwarranted invasion of personal privacy. The information that has been withheld under Exemption 6 consists of personal information, such as email addresses. We have determined that the individuals to whom this information pertains has a substantial privacy interest in withholding it.

You may contact our FOIA Public Liaison at 770-488-6277 for any further assistance and to discuss any aspect of your request. Additionally, you may contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer. The contact information for OGIS is as follows: Office of Government Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, Maryland 20740-6001, e-mail at ogis@nara.gov; telephone at 202-741-5770; toll free at 1-877-684-6448; or facsimile at 202-741-5769.

If you are not satisfied with the response to this request, you may administratively appeal by writing to the Deputy Agency Chief FOIA Officer, Office of the Assistant Secretary for Public Affairs, U.S. Department of Health and Human Services, Hubert H. Humphrey Building, 200 Independence Avenue, Suite 729H, Washington, D.C. 20201.You may also transmit your appeal via email to FOIARequest@psc.hhs.gov. Please mark both your appeal letter and envelope “FOIA Appeal.” Your appeal must be postmarked or electronically transmitted by Wednesday, June 16, 2021.

Sincerely,



Roger Andoh
CDC/ATSDR FOIA Officer
Office of the Chief Operating Officer
Phone: (770) 488-6399
Fax: (404) 235-1852

Enclosures

20-01138-FOIA

From: Staff Secretary
Sent: Sun, 15 Mar 2020 12:04:06 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Harrison, Brian (HHS/IOS);Redfield, Robert R. (CDC/OD);Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;Kushner, Jared C. EOP/WHO;Birx, Deborah L. EOP/NSC;Troye, Olivia EOP/NSC;Pottinger, Matthew F. EOP/WHO;Vought, Russell T. EOP/OMB;Zachary.McEntee@treasury.gov;Hicks, Hope C. EOP/WHO;'Mizelle, Chad';imt@who.eop.gov;Levi, William (OAG;Ornato, Tony M. EOP/WHO;Rinat, Ory S. EOP/WHO;Liddell, Christopher P. EOP/WHO;Ueland, Eric M. EOP/WHO;Grogan, Joseph J. EOP/WHO;McEntee, John D. II EOP/WHO;Pataki, Tim A. EOP/WHO;Hoelscher, Douglas L. EOP/WHO;Grisham, Stephanie A. EOP/WHO;Ditto, Jessica E. EOP/WHO;Gidley, Hogan H. EOP/WHO
Cc: Staff Secretary
Subject: RE: QUICK Review: Coronavirus TF - Post Card
Attachments: USPS_postcard-mockup_v5_with-stamp.pdf
Importance: High

All – good morning. Gentle reminder of this review as the post card was revised in many ways based on comments received. Thank you.

From: Staff Secretary
Sent: Saturday, March 14, 2020 10:17 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b)(6) Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; Harrison, Brian (HHS/IOS) <Brian.Harrison@hhs.gov>; 'olx1@cdc.gov' <olx1@cdc.gov>; Philbin, Patrick F. EOP/WHO <pfp2dcp@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Troye, Olivia EOP/NSC <Olivia.Troye@nsc.eop.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; Zachary.McEntee@treasury.gov; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; 'Mizelle, Chad' <chad.mizelle@hq.dhs.gov>; imt@who.eop.gov; Levi, William (OAG <William.Levi@usdoj.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; Rinat, Ory S. EOP/WHO <Ory.S.Rinat@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Ueland, Eric M. EOP/WHO <Eric.M.Ueland@who.eop.gov>; Grogan, Joseph J. EOP/WHO <Joseph.J.Grogan@who.eop.gov>; McEntee, John D. II EOP/WHO <John.D.McEntee2@who.eop.gov>; Pataki, Tim A. EOP/WHO <Timothy.A.Pataki@who.eop.gov>; Hoelscher, Douglas L. EOP/WHO <Douglas.L.Hoelscher@who.eop.gov>; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Gidley, Hogan H. EOP/WHO <Hogan.Gidley@who.eop.gov>
Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: RE: QUICK Review: Coronavirus TF - Post Card
Importance: High

All,

Attached is an updated post card, revised to reflect the comments received. In order to meet the USPS deadline, **please send any further comments or concerns by 8:30am tomorrow morning, Sunday,**

March 15. In particular, we would appreciate Dr. Fauci, Dr. Birx, and CDC's review of this updated version. Note as well two additional questions/flags received below for feedback:

(b)(5)

From: Staff Secretary <staffsecretary@who.eop.gov>
Sent: Saturday, March 14, 2020 5:00 PM
To: Fauci, Anthony (NIH/NIAID) [E] (b)(6) Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; Harrison, Brian (HHS/IOS) <Brian.Harrison@hhs.gov>; Philbin, Patrick F. EOP/WHO <Patrick.F.Philbin@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Troye, Olivia EOP/NSC <Olivia.Troye@nsc.eop.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; Kan, Derek T. EOP/OMB <Derek.T.Kan@omb.eop.gov>; David.Dwyer@treasury.gov; Zachary.McEntee@treasury.gov; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; 'Mizelle, Chad' <chad.mizelle@hq.dhs.gov>; imt@who.eop.gov; Levi, William (OAG <William.Levi@usdoj.gov>; Moran, John (OAG <John.Moran@usdoj.gov>; Blyth, Jonathan J. <Jonathan.Blyth@opm.gov>; 'CabanissDV3@opm.gov' <CabanissDV3@opm.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; Rinat, Ory S. EOP/WHO <Ory.S.Rinat@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Ueland, Eric M. EOP/WHO <Eric.M.Ueland@who.eop.gov>; Grogan, Joseph J. EOP/WHO <Joseph.J.Grogan@who.eop.gov>; McEntee, John D. II EOP/WHO <John.D.McEntee2@who.eop.gov>; White House Clearances <WhiteHouseClearances@state.gov>; Puesan, Cesar (HHS/OS/IOS) <Cesar.Puesan@hhs.gov>; Pataki, Tim A. EOP/WHO <Timothy.A.Pataki@who.eop.gov>; Hoelscher, Douglas L. EOP/WHO <Douglas.L.Hoelscher@who.eop.gov>; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Gidley, Hogan H. EOP/WHO <Hogan.Gidley@who.eop.gov>
Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: QUICK Review: Coronavirus TF - Post Card
Importance: High

All,

Attached is a draft mass-mailing postcard from the President with information on how to protect yourself from COVID-19 and what to do if you have symptoms. Please review and send any critical comments, being mindful to the limited ability to make large structural changes. Please also let us know if you believe any recommendations are miscategorized or mischaracterize the guidance. To meet the USPS deadline, please send any comments you have **by 7pm tonight.** If you need more time, please let us know so we can see if your request can be accommodated.

Thank you,

Staff Secretary

(b)(5)

(b)(5)

From: Redfield, Robert R. (CDC/OD)
Sent: Sun, 15 Mar 2020 14:52:18 +0000
To: Kushner, Jared C. EOP/WHO
Cc: Nat Turner;Birx, Deborah L. EOP/NSC
Subject: Re: [EXTERNAL] Updated deck on social distancing recommendations

Got it
Get Outlook for iOS
From: Kushner, Jared C. EOP/WHO <jck@who.eop.gov>
Sent: Sunday, March 15, 2020 10:50:08 AM
To: Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>
Cc: Nat Turner <(b)(6)> Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>
Subject: Re: [EXTERNAL] Updated deck on social distancing recommendations

(b)(5)

Sent from my iPhone

> On Mar 15, 2020, at 10:44 AM, Redfield, Robert R. (CDC/OD) <olx1@cdc.gov> wrote:
>
> Yes and we will include in our updated guidance related to social distancing we place to send up shortly
> Get Outlook for iOS
> **From:** Kushner, Jared C. EOP/WHO <jck@who.eop.gov>
> **Sent:** Sunday, March 15, 2020 9:53:46 AM
> **To:** Nat Turner <(b)(6)>
> **Cc:** Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>
> **Subject:** Re: [EXTERNAL] Updated deck on social distancing recommendations
>
> (b)(5)
>
> Sent from my iPhone

On Mar 15, 2020, at 9:25 AM, Nat Turner <(b)(6)> wrote:

Dr. Birx - (b)(5)

(b)(5)

(b)(5) Please let me know if you have any questions or additional feedback.

Thanks

-Nat

<Social Distancing v3.pptx>

From: Fauci, Anthony (NIH/NIAID) [E]
Sent: Sun, 15 Mar 2020 18:03:49 +0000
To: Keller, Catherine B. EOP/WHO;Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Harrison, Brian (HHS/IOS);Redfield, Robert R. (CDC/OD);Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;Kushner, Jared C. EOP/WHO;Birx, Deborah L. EOP/NSC;Troye, Olivia EOP/NSC;Pottinger, Matthew F. EOP/WHO;Vought, Russell T. EOP/OMB;Zachary.McEntee@treasury.gov;Hicks, Hope C. EOP/WHO;'Mizelle, Chad';imt@who.eop.gov;Levi, William (OAG;Ornato, Tony M. EOP/WHO;Rinat, Ory S. EOP/WHO;Liddell, Christopher P. EOP/WHO;Grogan, Joseph J. EOP/WHO;McEntee, John D. II EOP/WHO;Pataki, Tim A. EOP/WHO;Hoelscher, Douglas L. EOP/WHO;Grisham, Stephanie A. EOP/WHO;Ditto, Jessica E. EOP/WHO;Ueland, Eric M. EOP/WHO
Cc: Staff Secretary
Subject: RE: QUICK Review: Coronavirus TF - Social Distancing Recs
Attachments: Social Distancing v3 -with Fauci minor edit.pptx

See minor edit in red

From: Keller, Catherine B. EOP/WHO <Catherine.B.Keller@who.eop.gov>
Sent: Sunday, March 15, 2020 10:09 AM
To: Fauci, Anthony (NIH/NIAID) [E] <(b)(6) Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; Harrison, Brian (HHS/IOS) <Brian.Harrison@hhs.gov>; Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>; Philbin, Patrick F. EOP/WHO <Patrick.F.Philbin@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Troye, Olivia EOP/NSC <Olivia.Troye@nsc.eop.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; Zachary.McEntee@treasury.gov; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; 'Mizelle, Chad' <chad.mizelle@hq.dhs.gov>; imt@who.eop.gov; Levi, William (OAG <William.Levi@usdoj.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; Rinat, Ory S. EOP/WHO <Ory.S.Rinat@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Grogan, Joseph J. EOP/WHO <Joseph.J.Grogan@who.eop.gov>; McEntee, John D. II EOP/WHO <John.D.McEntee2@who.eop.gov>; Pataki, Tim A. EOP/WHO <Timothy.A.Pataki@who.eop.gov>; Hoelscher, Douglas L. EOP/WHO <Douglas.L.Hoelscher@who.eop.gov>; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Ueland, Eric M. EOP/WHO <Eric.M.Ueland@who.eop.gov>
Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: QUICK Review: Coronavirus TF - Social Distancing Recs
Importance: High

All,

Please see attached for draft recommendations on Social Distancing. Please send any feedback you have by **11:15am today.** Thank you.

(b)(5)

(b)(5)

From: Staff Secretary
Sent: Mon, 16 Mar 2020 12:54:06 +0000
To: Staff Secretary;Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Hicks, Hope C. EOP/WHO;Birx, Deborah L. EOP/NSC;Ornato, Tony M. EOP/WHO;Liddell, Christopher P. EOP/WHO;Fauci, Anthony (NIH/NIAID) [E];Harrison, Brian (HHS/IOS);Pottinger, Matthew F. EOP/WHO;Redfield, Robert R. (CDC/OD);Grisham, Stephanie A. EOP/WHO;Kushner, Jared C. EOP/WHO;imt@who.eop.gov;Berkowitz, Avrahm J. EOP/WHO;Deere, Judd P. EOP/WHO;Ditto, Jessica E. EOP/WHO;Kudlow, Larry A. EOP/WHO;Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;Vought, Russell T. EOP/OMB;Stewart, Jennifer SES SD;Conway, Kellyanne E. EOP/WHO
Subject: RE: FLASH CLEARANCE: G7 VTC TPs
Attachments: G7 Coronavirus Teleconference.docx

Reminder of the upcoming deadline for comments. Thank you.

From: Staff Secretary
Sent: Monday, March 16, 2020 6:52 AM
To: Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Fauci, Anthony (NIH/NIAID) [E] (b)(6) Harrison, Brian (HHS/IOS) <Brian.Harrison@hhs.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; olx1@cdc.gov; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; imt@who.eop.gov; Berkowitz, Avrahm J. EOP/WHO <avi@who.eop.gov>; Deere, Judd P. EOP/WHO <Judson.P.Deere@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Kudlow, Larry A. EOP/WHO <Lawrence.A.Kudlow@who.eop.gov>; Philbin, Patrick F. EOP/WHO <pfp2dcp@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; Stewart, Jennifer SES SD <Jennifer.Stewart@sd.mil>; Conway, Kellyanne E. EOP/WHO <KAC@who.eop.gov>
Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: FLASH CLEARANCE: G7 VTC TPs
Importance: High

All,

Please see attached for draft remarks for the President's G7 call today on efforts to coronavirus. Affirmative clearance is requested from **WHCO, OVP, NSC, HHS, and State**. Please send all comments and clearances by **9:00am today**.

Thank you,
Staff Secretary

(b)(5)

From: Moore, Caroline E. EOP/WHO
Sent: Mon, 23 Mar 2020 15:09:52 +0000
To: Birx, Deborah L. EOP/NSC;Kushner, Jared C. EOP/WHO;Redfield, Robert R. (CDC/OD);sh1@fda.hhs.gov;Short, Marc T. EOP/OVP
Cc: McGuffee, Tyler A. EOP/OVP;Rom, Colin (FDA/OC);Boyd, Charlton J. EOP/WHO;Dumbauld, Cassidy M. EOP/WHO;Hurst, Natalie R. EOP/OVP
Subject: Coronavirus Letter
Attachments: Coronas letter.pages.pdf.pdf

Good morning,

Mark wanted me to send this letter your way. Let me know if you have any questions.

Best,
Caroline

(b)(5)

(b)(5)

From: Pottinger, Matthew F. EOP/WHO
Sent: Tue, 24 Mar 2020 10:27:02 +0000
To: Debi Birx;Redfield, Robert R. (CDC/OD);Short, Marc T. EOP/OVP;O'Brien, Robert C. EOP/WHO;AMA2 (OS/IOS) Alex Azar;Adams, Jerome (HHS/OASH);Kushner, Jared C. EOP/WHO;Liddell, Christopher P. EOP/WHO;Fauci, Anthony (NIH/NIAID) [E]
Subject: regarding masks and Covid-19
Attachments:

(b)(5)

(b)(5)

(b)(5)

(b)(5)

Best
Matt Pottinger
Deputy National Security Advisor.
Sent from my iPhone

Begin forwarded message:

From: KY Yuen <kyyuen@hku.hk>
Date: March 23, 2020 at 10:39:53 PM EDT
To: "Lyons, John" <john.lyons@wsj.com>
Subject: [EXTERNAL] Wall Street Journal question regarding masks and Covid-19

Dear John,

Thanks for your message.

i. Studies have shown that wearing a mask with frequent hand hygiene significantly reduced transmission of influenza virus (also an enveloped respiratory virus with high transmissibility) in a community setting. But once the use of surgical mask is removed, the effect of hand hygiene becomes insignificant. (see attached)

ii. Moreover, besides protecting yourself from this novel coronavirus or other respiratory viruses by wearing a mask, for those who are infected with this novel coronavirus asymptomatically (subclinical) or symptomatically, this will markedly reduce the amount of virus shedding in the saliva and respiratory droplet. This will therefore

markedly reduce the community transmission. But the wearers must wear it correctly, learn to avoid touching the mask involuntarily and still observe good hand hygiene. This is not easy.

iii. Except for the rich people, millions of HK people are living in very small housing estate or subdivided flat of 60 square feet. Advice has to be pragmatic. We go out to work, exercise or hiking. The first thing is to go into a VERY crowded elevator, then into very crowded MTR or bus, then going up a crowded elevator to our office OR to the place of hiking and exercise, and the reverse order happens when we go home. If we take off a mask and throw it away every time when not in a crowded environment and put up a new mask when entering a crowded environment, we need to use at least 8 mask per day when lunch and dinner outside are counted. Thus all these advice by many authorities may not be pragmatic.

HK is the most densely populated city in the world. Before the epidemic, at least 0.1 million HK residents or tourists cross our mainland border every day carrying the virus with them into HK. If not for universal masking once we depart from our home every day and wearing it correctly with hand hygiene, HK would be like Korea and Italy LONG ago. We now achieve 250 confirmed cases per 7.5 million population. This is really a record and is BETTER than other countries with a HOT weather and much less epidemic pressure from Chinese mainlanders.

Hope that this message will explain clearly why most medical colleagues in HK advocate universal masking once leaving their home. Note that the logistic of mask availability is another issue that requires other ways to work on.

Warm regards.
KY

From: Lyons, John [mailto:john.lyons@wsj.com]
Sent: Tuesday, March 24, 2020 10:16 AM
To: kyyuen@hku.hk
Subject: Wall Street Journal question regarding masks and Covid-19

Dear Professor Yuen,

I am a senior reporter at the WSJ based here in Hong Kong.

I am interested in your perspective for a story I am writing on whether "to mask or not to mask" in the fight against the new Coronavirus.

On the one hand, the WHO has said healthy people need not wear masks on the grounds that they are not effective if not properly used; may lead to a false sense of security; and could use up scarce supplies.
On the other hand, many people, especially in Asia, see it as common sense a barrier will help contain the spread, especially when some carriers are asymptomatic. In

Hong Kong, the experience of successfully fighting SARS seems to add evidence that masks are a good idea.

I can be reached at 6281 3512. I am trying to finish the story today. It will run in the newspaper and on our website globally.

Best,

John

--

John Lyons
The Wall Street Journal.
Hong Kong Cell: +(852) 6281.3512

Epidemiol. Infect. (2014), **142**, 922–932. © Cambridge University Press 2014
doi:10.1017/S095026881400003X

REVIEW ARTICLE
Hand hygiene and risk of influenza virus infections in the community: a systematic review and meta-analysis

V. W. Y. WONG[1], B. J. COWLING[2]* AND A. E. AIELLO[3]

[1] *School of Nursing, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong Special Administrative Region, China*
[2] *Division of Epidemiology and Biostatistics, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong Special Administrative Region, China*
[3] *Department of Epidemiology, University of North Carolina Gillings School of Global Public Health, Chapel Hill, NC, USA*

Received 17 October 2013; Final revision 6 December 2013; Accepted 24 December 2013; first published online 23 January 2014

SUMMARY

Community-based prevention strategies for seasonal and pandemic influenza are essential to minimize their potential threat to public health. Our aim was to evaluate the efficacy of hand hygiene interventions in reducing influenza transmission in the community and to investigate the possible modifying effects of latitude, temperature and humidity on hand hygiene efficacy. We identified 979 articles in the initial search and 10 randomized controlled trials met our inclusion criteria. The combination of hand hygiene with facemasks was found to have statistically significant efficacy against laboratory-confirmed influenza while hand hygiene alone did not. Our meta-regression model did not identify statistically significant effects of latitude, temperature or humidity on the efficacy of hand hygiene. Our findings highlight the potential importance of interventions that protect against multiple modes of influenza transmission, and the modest efficacy of hand hygiene suggests that additional measures besides hand hygiene may also be important to control influenza.

Key words: Hygiene – personal, infectious disease control, influenza.

INTRODUCTION

Community-based prevention strategies for seasonal and pandemic influenza are essential to minimize their potential threat to public health [1, 2]. Vaccination is the cornerstone of prevention of seasonal and pandemic influenza virus infections [3]. Although existing evidence demonstrates that vaccination can be an effective approach to protect the population against influenza [4–6], uptake in some populations remains low [7–9]. In the event of a novel influenza pandemic, vaccines that provide good protection against the new strain might not be available for 4–6 months, and other control measures would be required in the interim, including non-pharmaceutical interventions such as hand hygiene [10]. Hand hygiene interventions are appealing because they can be applied in both developed and lesser developed regions at low cost [10, 11].

Influenza virus spreads among humans either by inhalation of virus-loaded droplets into the respiratory tract, by direct contact, e.g. hand shaking, or by indirect contact with infected individuals via contaminated

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objects (fomites) [12–14]. The relative importance of alternative modes of transmission is controversial, while the potential for efficacy of hand hygiene implicitly requires that direct or indirect contact is an important mode of transmission [15]. Recent research has suggested that the importance of contact transmission may vary in different regions [16]. For instance, ambient temperature and relative humidity may modify the mode of influenza transmission. Because small droplet transmission is enhanced by low or very high humidity [17], it has been hypothesized that in temperate zones with a cool and dry winter, influenza transmission is predominantly by aerosol while in tropical zones with a warm and humid environment, the virus is more often transmitted by the contact route [16]. If this hypothesis is correct, the effectiveness of hand hygiene interventions would be expected to vary by latitude, ambient temperature and humidity. If virus transmission in temperate zones primarily occurs by aerosol, then hand hygiene interventions would be expected to be less effective.

Since the World Health Organization highlighted the need for controlled trials in formulating the use of non-pharmaceutical interventions in preventing influenza transmission in 2006 [10], various randomized controlled trials (RCTs) and systematic reviews [8, 18] on the effectiveness of hand hygiene interventions in reducing influenza and other respiratory virus infections have been published. By contrast, there are three existing meta-analyses assessing the effectiveness of hand hygiene interventions in preventing respiratory diseases, none of which focused on influenza viruses specifically [19–21]. This systematic review and meta-analysis aims to evaluate the impact of hand hygiene interventions in preventing influenza virus transmission in the community setting and to investigate the possible modifying effects of latitude, temperature and humidity on hand hygiene efficacy for influenza virus infection.

METHODS

This meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses recommendations (PRISMA) statement [22].

Search strategy

We searched the Medline (January 1946 to November 2013), PubMed (January 1960 to November 2013), EMBASE (1974 to November 2013), and Cochrane Library databases and the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, 2013, Issue 11) databases using the following search terms in all fields regardless of publication date and language:

#1: 'hand hygiene' OR 'hand washing' OR 'handwashing' OR 'hand-wash' OR 'hand sanitizers' OR 'hand sanitizer' OR 'hand rub'

#2: 'influenza' OR 'flu' OR 'respiratory infection' OR 'respiratory virus' OR 'respiratory tract infection' OR 'respiratory illness' OR 'fever' OR 'cough' OR 'sore throat' OR 'runny nose' OR 'nasal congestion' OR 'sneezing' OR 'malaise' OR 'muscle aches' OR 'headache'

#3: #1 AND #2

To identify further studies of interest, manual search was performed with the reference lists of retrieved review articles.

Eligibility criteria

We included any RCT comparing the effect of hand hygiene interventions with no intervention in reducing influenza virus transmission in community settings, in which study subjects or cluster units in a population were assigned prospectively into intervention and control groups using random allocation [23]. A community setting was defined as an open setting without confinement and special care for the participants. Articles describing any hand hygiene-related interventions alone were included.

Study selection

The primary outcome was the relative reduction of influenza virus infections confirmed by reverse-transcriptase–polymerase chain reaction (RT–PCR), virus culture or rapid antigen test in the hand hygiene intervention group compared to the control group. The secondary outcome measure was the relative reduction of influenza-like illnesses (ILI) confirmed by either professional clinical diagnosis or reported symptoms. We adopted a febrile acute respiratory illness (FARI) definition which defines cases as the presence of fever with cough or sore throat [24].

Two independent reviewers (V.W.Y.C., B.J.C.) screened all titles of studies identified by the search strategy individually, then subsequently reviewed the abstracts of the potential relevant studies. If the

studies described hand hygiene interventions and influenza transmission, the reviewers read the full-length text. Further discussion was held if a consensus was not reached.

Evidence quality assessment

We evaluated the methodological quality of each outcome with GRADEprofiler (GRADEpro) [25], as recommended by the Cochrane Collaboration. We ranked the quality of evidence of each outcome as high, moderate, low, and very low based on its risk of bias, consistency, directness, precision of the results and publication bias.

Statistical analysis

The effect estimates were summarized as risk ratios (RRs) and their corresponding 95% confidence intervals (CIs). Due to substantial variation in RRs, the summary statistic was estimated with the more conservative Mantel–Haenszel (MH) random-effects model since it accounts for both the potential variability in effects and also the random variability across studies associated with different study designs and settings. We assessed publication bias graphically with Begg's funnel plot [26] and also implemented Egger's test [27] and the Begg & Mazumdar rank correlation [26] to quantify the evidence of publication bias statistically. For Egger's test, we considered evidence of publication bias if the two-tailed P value was <0·05. For rank correlation, we considered evidence of publication bias if the two-tailed P value was <0·10 since this test statistic has been shown to be less sensitive than Egger's test [28]. We calculated the I^2 statistic to assess the extent of inconsistency for each pooled estimate. The I^2 statistic quantified the proportion of total variations across effect estimates due to heterogeneity but not sampling error, and ranges from 0% to 100% such that 0% indicates homogeneity and 100% reflects substantial heterogeneity [29].

We performed separate analyses of studies in developed and developing countries due to their systematic differences such as cultural background, educational level, etc., and performed a subgroup analysis of hand hygiene interventions with or without facemask use for both outcomes. Meta-regression was conducted to further assess if any covariates could explain the variation across studies in the effect of hand hygiene on laboratory-confirmed influenza, i.e. the primary outcome. To test for a modifying impact of temperature and humidity on efficacy of hand hygiene, we constructed univariate random-effects regression models with a number of covariates including latitude, average temperature and humidity during studies. We calculated the mean of the average temperature and relative humidity during the recorded study months by using the data provided by WeatherSpark [30], which is a weather website summarizing historical data for the world from the National Oceanic and Atmospheric Administration. We carried out the meta-analysis using RevMan version 5.1 software [31] and the Comprehensive Meta-analysis version 2 software [32].

RESULTS

Search results

We identified 979 articles in the initial database search, of which 41 were retrieved based on their title and abstract content. Of the 41 retrieved articles, ten were eligible for meta-analysis based on our inclusion criteria (see Fig. 1). We excluded 31 studies after the full-length assessment [33–63] for the following reasons: studies were not RCTs, ineligible definition on ILI, no definition on respiratory diseases outcomes, hand hygiene interventions as a part of infection control programme, or no control group (see online Appendix). The characteristics of the ten eligible RCTs are summarized in Table 1, which comprised nine studies assessing laboratory-confirmed influenza [64–72] and ten studies assessing ILI [64–73].

Quality of evidence

The methodological qualities of studies were assessed by GRADEpro. Studies that used a laboratory-confirmed influenza outcome were graded as high, while studies with an ILI-only outcome were graded as moderate. The evidence profile for each outcome is summarized in Table 2 (see also online Appendix). All included trials were RCTs with proper randomization and their allocation sequences were properly concealed. They were either single-blinded to the recruiting physician, principal investigator and statisticians or not blinded to any personnel. No significant publication bias was noted (see online Appendix). The imprecision was, however, significant in most of the trials due to small sample size, inadequate case ascertainment, poor compliance to interventions,

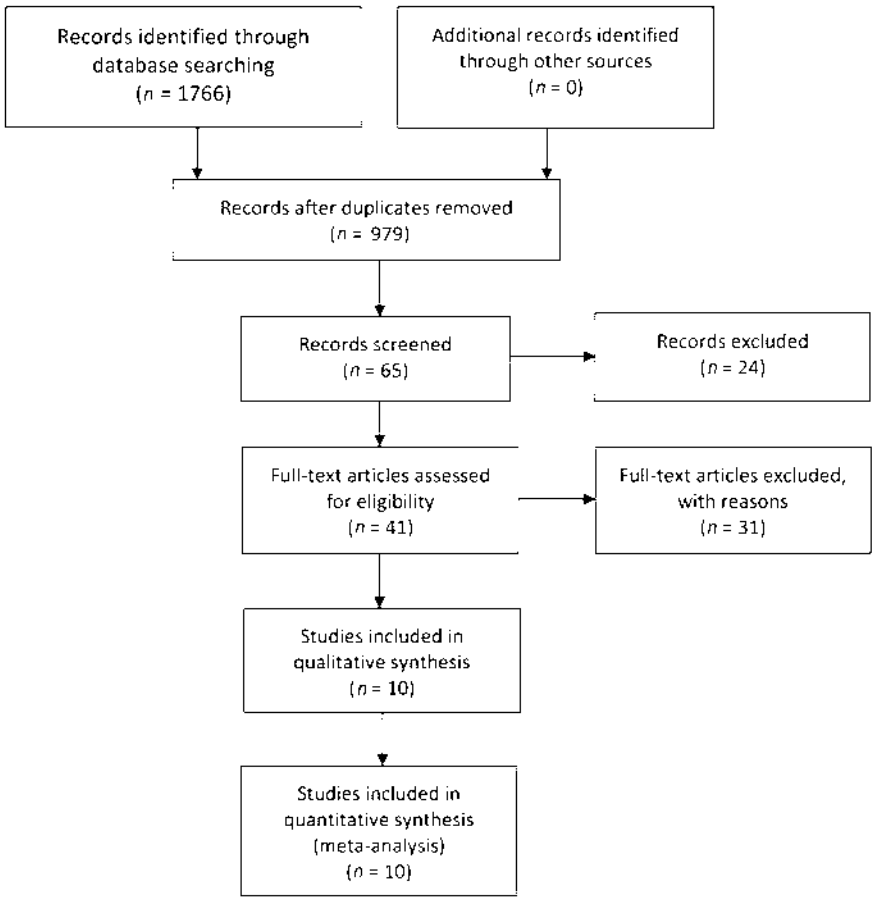

Fig. 1. Flow diagram of the process and results of study selection.

and insufficient statistical power. Most (8/10) of the studies received funding from the United States Centers for Disease Control and Prevention, one study was supported by the German Federal Ministry of Health, and one from a pharmaceutical company.

Efficacy of hand hygiene interventions

The forest plot for studies conducted in developed countries is shown in Figure 2. There was an insignificant relative risk reduction of 18% in the pooled analysis (RR 0·82, 95% CI 0·66–1·02, $I^2 = 0\%$, $P = 0{\cdot}07$) of laboratory-confirmed influenza outcome. While a significant reduction of 27% was reported for the hand hygiene and facemask group (RR 0·73, 95% CI 0·53–0·99, $I^2 = 0\%$, $P = 0{\cdot}05$), the hand hygiene only comparison was not statistically significant. A significant RR reduction of 22% (RR 0·78, 95% CI 0·68–0·90, $I^2 = 0\%$, $P = 0{\cdot}0008$) was found in the pooled analysis of ILI outcomes. In the subgroup analyses, similar to the result from the laboratory-confirmed influenza outcome, a significant reduction of 27% (RR 0·73, 95% CI 0·60–0·89, $I^2 = 0\%$, $P = 0{\cdot}002$) was noted for the combined comparison of hand hygiene and facemask use while the result from hand hygiene alone was not statistically significant.

There were only two studies in less developed countries. The efficacy of hand hygiene was not significant in the pooled analysis for the laboratory-confirmed influenza outcome. For the ILI outcome, a non-significant relative increase was observed for the efficacy of combined comparison of hand hygiene and facemask use (see online Appendix).

Meta-regression

We used meta-regression to explore if any particular covariate could explain the observed heterogeneity across studies (Table 3). A systematic review suggests that facemasks can reduce aerosol transmission of influenza virus [74]; therefore, we conducted meta-regression on hand hygiene interventions without facemask to assess the independent effects of hand

Table 1. *Characteristics of included studies*

Characteristics	No. of studies (%)
Country	
Developed	8 (80)
Developing	2 (20)
Latitude (degrees)	
⩽23·5	7 (70)
>23·5	3 (30)
Setting	
Household	5 (50)
Elementary school	2 (20)
University residential hall	2 (20)
Office	1 (10)
Transmission mode	
Primary	6 (60)
Secondary	4 (40)
Interventions evaluated*	
Hand sanitizer and facemask	4 (31)
Hand sanitizer, non-antibacterial soap and education	3 (23)
Hand sanitizer	2 (15)
Non-antibacterial soap and education	2 (15)
Non-antibacterial soap, education and facemask	1 (8)
Hand sanitizer, non-antibacterial soap, education and facemask	1 (8)
Outcome assessed*	
Laboratory-confirmed influenza	9 (50)
Influenza-like-illness	9 (50)

* Some studies assess more than one intervention and outcome.

hygiene even after adjusting for potential factors that could impact heterogeneity. For the studies conducted in developed countries, we found that a 10° rise in latitude [relative risk ratio (RRR) 1·28, 95% CI 0·91 1·79, $P=0·15$], average temperature (RRR 0·82, 95% CI 0·59–1·13, $P=0·22$) and average relative humidity (RRR 0·63, 95% CI 0·32–1·22, $P=0·17$) were not statistically significantly associated with a change in the efficacy of hand hygiene in developed countries but the direction of the estimate for relative humidity was consistent with the hypothesis that influenza transmission is predominately by aerosol in temperate zones while the virus is commonly transmitted by contact route in tropical areas (see online Appendix).

DISCUSSION

We examined the efficacy of hand hygiene interventions in preventing influenza virus transmission in the community. The subgroup analysis from developed countries suggested that a combined intervention consisting of hand hygiene with facemasks is an effective strategy to prevent influenza, but we did not confirm the efficacy of hand hygiene alone for reducing influenza illness. This is consistent with evidence on the important role of aerosol transmission of influenza, such that interventions against contact transmission alone like hand hygiene may not be sufficient to control influenza transmission in the community [75]. However, shortcomings related to statistical power to detect the impact of hand hygiene suggest that future studies should continue to study the impact of hand hygiene independently on laboratory-confirmed influenza outcomes.

Seasonal and pandemic influenza viruses cause a major burden of illness, hospitalization and death. Our review captured studies with the outcomes of laboratory-confirmed influenza or FARI (ILI) which is a fairly specific outcome to influenza. We did not include studies with broader definitions of respiratory illness, which could encompass many other outcomes such as other non-influenza viral infections, asthma exacerbation, allergic rhinitis or non-viral respiratory infections, because the efficacy of hand hygiene intervention on each respiratory illness might vary. According to these inclusion criteria, our review did not include studies that examined the efficacy of hand hygiene against broader respiratory illness outcomes, but these studies did identify reasonable efficacy of hand hygiene interventions [46, 54–56]. For this reason, this meta-analysis goes beyond three formerly published reviews [19 21] by focusing on influenza virus infections rather than any respiratory illness symptoms, and by exploring the hypothesis that modes of transmission may vary from region to region. In our meta-regression model, although we did not find any significant effects, we noted evidence for effects of all three covariates particularly from relative humidity. The insignificant result may due to relatively low sample size.

There are several noteworthy limitations in this review. The greatest limitation is the small number of RCTs that have been conducted to date on the efficacy of hand hygiene to control influenza. Since there are only a few studies involving the same hand hygiene interventions among the included studies, we are unable to provide intervention-specific pooled estimates. The efficacy of individual hand hygiene interventions, hence, cannot be compared. The heterogeneity across studies is another limitation and to address this

Table 2. *Grade evidence profile*

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Hand hygiene vs. control (combined data)		Risk ratio (95% CI)	Absolute	Quality	Importance
Laboratory confirmed influenza (follow-up 2–19 months; assessed with nasal and/ or throat swab specimen collected for RT–PCR or Quick-Vue test)												
9	Randomized trial[1]	No serious risk of bias[2,3,4]	No serious inconsistency[5]	No serious indirectness[6]	Serious[7]	Strong association[8]	415/26426 (1·6%)	613/29440 (2·1%)	RR 0·79 (0·61–1·02)	5 fewer per 1000 (from 9 fewer to 1 more)	High	Critical
Clinically diagnosed influenza-like illness [follow-up 2–19 months; assessed with FARI definition (fever AND sore throat AND/OR cough)]												
10	Randomized trials[1]	No serious risk of bias[9,10,11]	No serious inconsistency[5]	No serious indirectness[12]	Serious[13]	None	2171/26490 (8·2%)	3094/29505 (10·5%)	RR 0·95 (0·77–1·17)	5 fewer per 1000 (from 24 fewer to 18 more)	Moderate	Important

CI, Confidence interval; FARI, febrile acute respiratory illness.
The superior numerical indicators refer to notes in Supplementary Table S2 (see online Appendix).

we performed separate analyses for developed and developing countries' data and meta-regression for hand hygiene only laboratory-confirmed influenza outcome. Although we cannot exclude the possible role of other covariates, we minimized the variations of different study design characteristics by including only RCTs. The variations associated with different settings and different hand hygiene interventions, however, cannot be ignored. The possible clustering effect may also be a limitation in our review. Since we did not adjust for clustering in the analysis, this may lead to skewed results with possibly higher risk of type I error and narrower confidence intervals. However, one previous study suggested that clustering effect did not have a significant effect on heterogeneity or overall pooled estimates from their meta-analysis assessing the effectiveness of hand hygiene interventions on infectious disease risk in the community setting [20].

The findings of this review have implications for the recommendations and guidelines of hand hygiene and facemask use in the future. Given the lack of substantial efficacy of hand hygiene identified in our review (Fig. 3), and the increasing evidence supporting a role of aerosol as a mode of influenza virus transmission [75–78], further public health initiatives may need to re-examine the control measures for aerosol transmission. In particular, measures such as hand hygiene that focus on reducing one mode of transmission (i.e. contact) may not be sufficient to control transmission. Measures that may require more detailed consideration include N95-type respirators, improved indoor ventilation, quarantining of infected individuals, and even the use of air humidifiers, given the potential role of humidity in reducing viability of aerosols [16, 17]. While elucidating the possible influence of humidity in influenza transmission among human populations further confirms its contribution on influenza seasonality, particularly in temperate regions, the detailed mechanisms have yet to be explored.

The insignificant findings from hand hygiene intervention alone and subgroup analyses from developing countries' data does not necessarily indicate that hand hygiene is an ineffective measure for preventing influenza virus transmission. Rather, the non-significant results for hand hygiene alone could raise questions on compliance with existing recommendations on hand hygiene in the community. Indeed, hand washing and sanitizing needs to be practised properly and after all potential critical contamination events

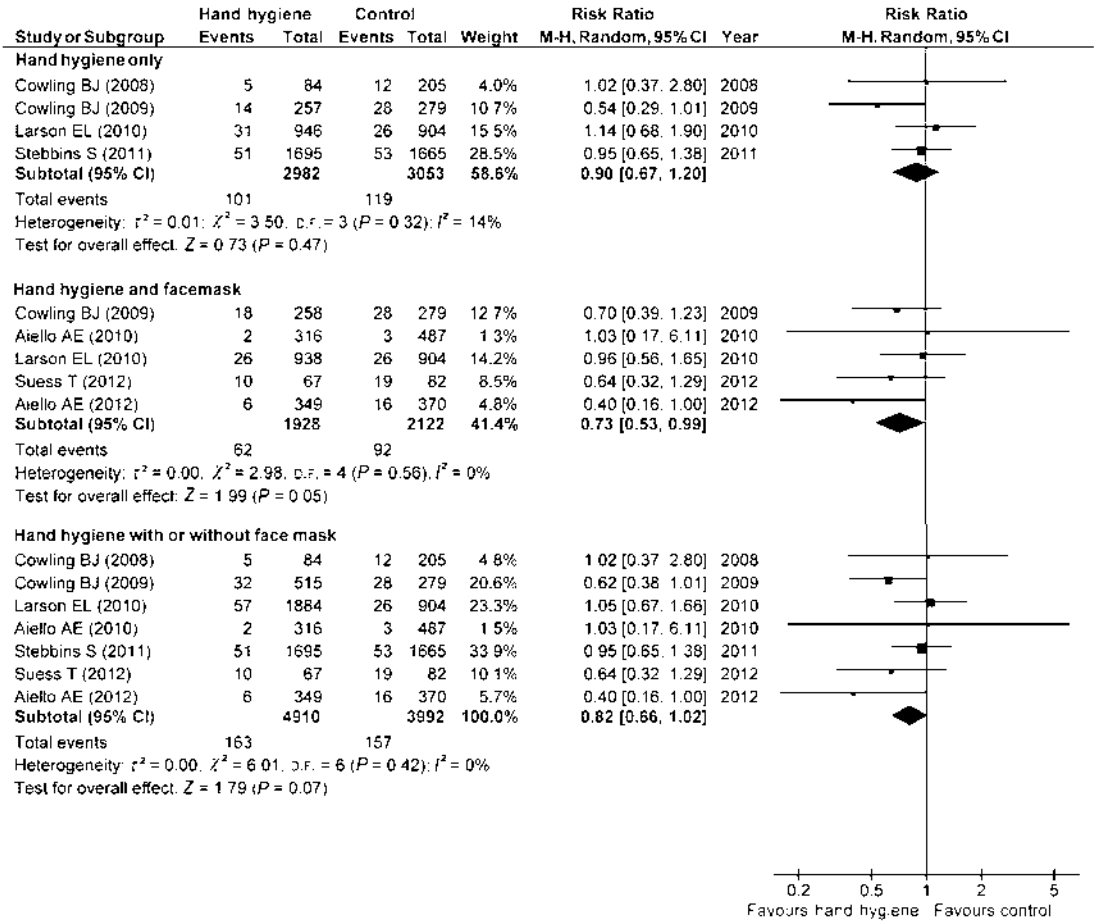

Fig. 2. Risk ratios for the effect of hand hygiene interventions with or without facemask on laboratory-confirmed influenza in studies conducted in developed countries.

that might occur throughout the day. The CDC recommends that individuals wash their hands with soap and water for at least 20 seconds, properly lathering hands, washing soap off, and drying hands completely or if a sink is not available, to use hand sanitizer when hands are not visibly soiled [15]. These recommendation are rarely carried out with high compliance in the general population [79]. Clearly, hand hygiene interventions not only need to be proven effective, but they also need to be widely adopted by most of the population if they are to mitigate influenza transmission effectively. Given the existing public health recommendations and guidelines on using hand hygiene interventions in preventing influenza transmission [11, 80, 81], the compliance rate in the community has not yet been well established. To our knowledge, there are only a few studies exploring interventions to promote hand hygiene practice in the community [82–86]. Further studies, in this regard, are warranted in relation to compliance rates of hand hygiene interventions and the possible interventions to promote such practices in the community.

In conclusion, hand hygiene interventions have been, and will continue to be an important component of the public health response to seasonal and pandemic influenza. However, expectations on the impact of such measures may need to be limited, given the results of our review indicating only potentially modest effects of this specific intervention. Variation in the importance of aerosol transmission in different regions is an intriguing possibility, and could imply the need for greater focus on alternative control measures particularly in temperate zones.

SUPPLEMENTARY MATERIAL

For supplementary material accompanying this paper visit http://dx.doi.org/10.1017/S095026881400003X.

Table 3. *Univariate regression analyses on different covariates in relation to the risk of laboratory-confirmed influenza in combined countries' data and developed countries' data (hand hygiene intervention only)*

Laboratory-confirmed influenza (combined data – hand hygiene intervention only)						
	Combined data (six studies)			Developed countries only (four studies)		
Covariates	RRR	95% CI	*P* value	RRR	95% CI	*P* value
Latitude (10° change)	1·00	0·66 1·54	0·984	1·28	0·91 1·79	0·145
Average temperature (10 °C change)	0·93	0·59 1·49	0·778	0·82	0·59 1·13	0·221
Average relative humidity (10 percentage point change)	1·20	0·89 1·63	0·227	0·63	0·32 1·22	0·169

RRR, Relative risk ratio; CI, confidence interval.

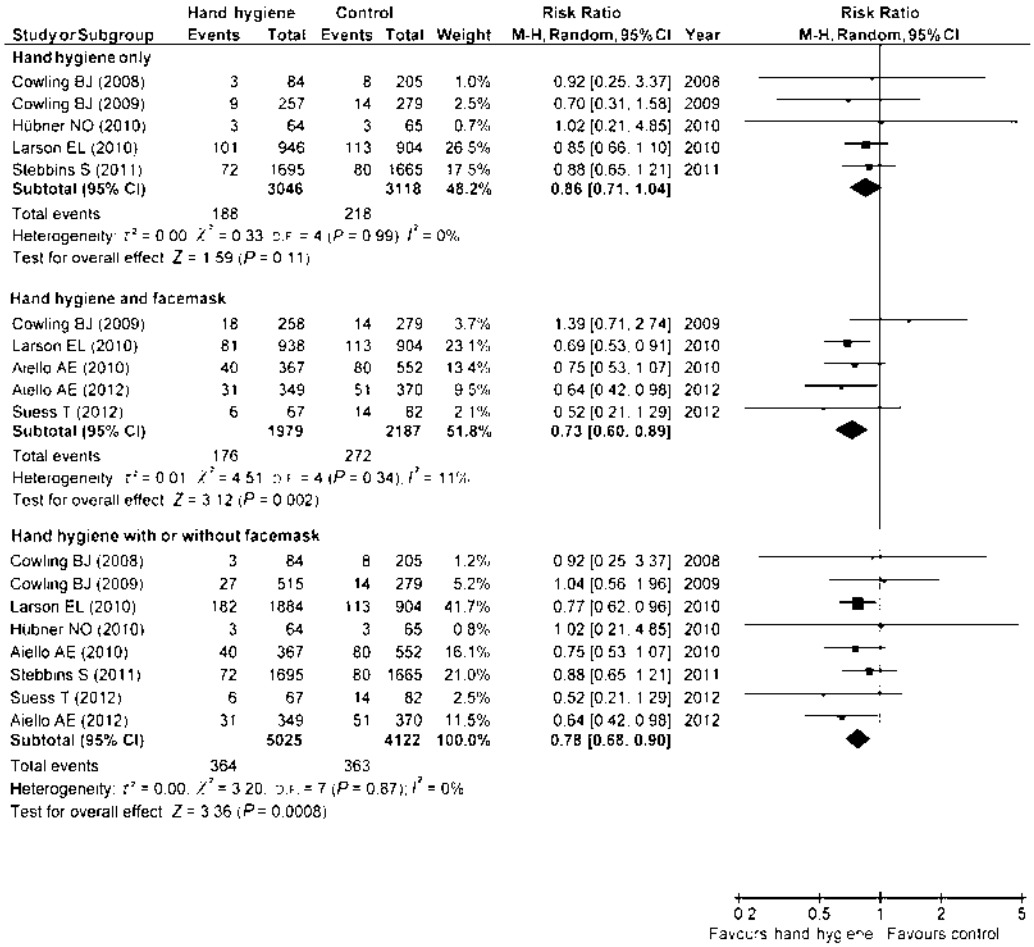

Fig. 3. Risk ratios for the effect of hand hygiene interventions with or without facemask on influenza-like illness in studies conducted in developed countries.

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DECLARATION OF INTEREST

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From: Pottinger, Matthew F. EOP/WHO
Sent: Tue, 24 Mar 2020 18:01:43 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Debi Birx;Redfield, Robert R. (CDC/OD);Short, Marc T. EOP/OVP;O'Brien, Robert C. EOP/WHO;AMA2 (OS/IOS);Adams, Jerome (HHS/OASH);Kushner, Jared C. EOP/WHO;Liddell, Christopher P. EOP/WHO
Subject: RE: regarding masks and Covid-19
Attachments:
hand_hygiene_and_risk_of_influenza_virus_infections_in_the_community_a_systematic_review_and_metaanalysis.pdf

Thanks, Tony. Here's a thumbnail proposal:

(b)(5)

Matt

From: Fauci, Anthony (NIH/NIAID) [E] (b)(6)
Sent: Tuesday, March 24, 2020 12:16 PM
To: Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Debi Birx <BirxDL@state.gov>; Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>; Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; O'Brien, Robert C. EOP/WHO <rco84@who.eop.gov>; AMA2 (OS/IOS) <AMA2@HHS.GOV>; Adams, Jerome (HHS/OASH) <Jerome.Adams@hhs.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>
Subject: RE: regarding masks and Covid-19

Matt:
You make a very good point deserving of further serious discussion.
Best,
Tony

Anthony S. Fauci, MD
Director
National Institute of Allergy and Infectious Diseases
Building 31, Room 7A-03
31 Center Drive, MSC 2520
National Institutes of Health
Bethesda, MD 20892-2520
Phone: **(301) 496-2263**
FAX: **(301) 496-4409**
E-mail: (b)(6)

From: Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>
Sent: Tuesday, March 24, 2020 6:27 AM
To: Debi Birx <BirxDL@state.gov>; Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>; Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; O'Brien, Robert C. EOP/WHO <rco84@who.eop.gov>; AMA2 (OS/IOS) <AMA2@HHS.GOV>; Adams, Jerome (HHS/OASH) <Jerome.Adams@hhs.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Fauci, Anthony (NIH/NIAID) [E] (b)(6)
Subject: regarding masks and Covid-19

(b)(5)

Hong Kong.
Best
Matt Pottinger
Deputy National Security Advisor.

Sent from my iPhone

Begin forwarded message:

> **From:** KY Yuen <kyyuen@hku.hk>
> **Date:** March 23, 2020 at 10:39:53 PM EDT
> **To:** "Lyons, John" <john.lyons@wsj.com>
> **Subject: [EXTERNAL] Wall Street Journal question regarding masks and Covid-19**
>
> Dear John,
>
> Thanks for your message.

i. Studies have shown that wearing a mask with frequent hand hygiene significantly reduced transmission of influenza virus (also an enveloped respiratory virus with high transmissibility) in a community setting. But once the use of surgical mask is removed, the effect of hand hygiene becomes insignificant. (see attached)

ii. Moreover, besides protecting yourself from this novel coronavirus or other respiratory viruses by wearing a mask, for those who are infected with this novel coronavirus asymptomatically (subclinical) or symptomatically, this will markedly reduce the amount of virus shedding in the saliva and respiratory droplet. This will therefore markedly reduce the community transmission. But the wearers must wear it correctly, learn to avoid touching the mask involuntarily and still observe good hand hygiene. This is not easy.

iii. Except for the rich people, millions of HK people are living in very small housing estate or subdivided flat of 60 square feet. Advice has to be pragmatic. We go out to work, exercise or hiking. The first thing is to go into a VERY crowded elevator, then into very crowded MTR or bus, then going up a crowded elevator to our office OR to the place of hiking and exercise, and the reverse order happens when we go home. If we take off a mask and throw it away every time when not in a crowded environment and put up a new mask when entering a crowded environment, we need to use at least 8 mask per day when lunch and dinner outside are counted. Thus all these advice by many authorities may not be pragmatic.

HK is the most densely populated city in the world. Before the epidemic, at least 0.1 million HK residents or tourists cross our mainland border every day carrying the virus with them into HK. If not for universal masking once we depart from our home every day and wearing it correctly with hand hygiene, HK would be like Korea and Italy LONG ago. We now achieve 250 confirmed cases per 7.5 million population. This is really a record and is BETTER than other countries with a HOT weather and much less epidemic pressure from Chinese mainlanders.

Hope that this message will explain clearly why most medical colleagues in HK advocate universal masking once leaving their home. Note that the logistic of mask availability is another issue that requires other ways to work on.

Warm regards.
KY

From: Lyons, John [mailto:john.lyons@wsj.com]
Sent: Tuesday, March 24, 2020 10:16 AM
To: kyyuen@hku.hk
Subject: Wall Street Journal question regarding masks and Covid-19

Dear Professor Yuen,

I am a senior reporter at the WSJ based here in Hong Kong.

I am interested in your perspective for a story I am writing on whether "to mask or not to mask" in the fight against the new Coronavirus.

On the one hand, the WHO has said healthy people need not wear masks on the grounds that they are not effective if not properly used; may lead to a false sense of security; and could use up scarce supplies.
On the other hand, many people, especially in Asia, see it as common sense a barrier will help contain the spread, especially when some carriers are asymptomatic. In Hong Kong, the experience of successfully fighting SARS seems to add evidence that masks are a good idea.

I can be reached at 6281 3512. I am trying to finish the story today. It will run in the newspaper and on our website globally.

Best,

John

--

John Lyons
The Wall Street Journal.
Hong Kong Cell: +(852) 6281.3512

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REVIEW ARTICLE
Hand hygiene and risk of influenza virus infections in the community: a systematic review and meta-analysis

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SUMMARY

Community-based prevention strategies for seasonal and pandemic influenza are essential to minimize their potential threat to public health. Our aim was to evaluate the efficacy of hand hygiene interventions in reducing influenza transmission in the community and to investigate the possible modifying effects of latitude, temperature and humidity on hand hygiene efficacy. We identified 979 articles in the initial search and 10 randomized controlled trials met our inclusion criteria. The combination of hand hygiene with facemasks was found to have statistically significant efficacy against laboratory-confirmed influenza while hand hygiene alone did not. Our meta-regression model did not identify statistically significant effects of latitude, temperature or humidity on the efficacy of hand hygiene. Our findings highlight the potential importance of interventions that protect against multiple modes of influenza transmission, and the modest efficacy of hand hygiene suggests that additional measures besides hand hygiene may also be important to control influenza.

Key words: Hygiene – personal, infectious disease control, influenza.

INTRODUCTION

Community-based prevention strategies for seasonal and pandemic influenza are essential to minimize their potential threat to public health [1, 2]. Vaccination is the cornerstone of prevention of seasonal and pandemic influenza virus infections [3]. Although existing evidence demonstrates that vaccination can be an effective approach to protect the population against influenza [4–6], uptake in some populations remains low [7–9]. In the event of a novel influenza pandemic, vaccines that provide good protection against the new strain might not be available for 4–6 months, and other control measures would be required in the interim, including non-pharmaceutical interventions such as hand hygiene [10]. Hand hygiene interventions are appealing because they can be applied in both developed and lesser developed regions at low cost [10, 11].

Influenza virus spreads among humans either by inhalation of virus-loaded droplets into the respiratory tract, by direct contact, e.g. hand shaking, or by indirect contact with infected individuals via contaminated

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objects (fomites) [12–14]. The relative importance of alternative modes of transmission is controversial, while the potential for efficacy of hand hygiene implicitly requires that direct or indirect contact is an important mode of transmission [15]. Recent research has suggested that the importance of contact transmission may vary in different regions [16]. For instance, ambient temperature and relative humidity may modify the mode of influenza transmission. Because small droplet transmission is enhanced by low or very high humidity [17], it has been hypothesized that in temperate zones with a cool and dry winter, influenza transmission is predominantly by aerosol while in tropical zones with a warm and humid environment, the virus is more often transmitted by the contact route [16]. If this hypothesis is correct, the effectiveness of hand hygiene interventions would be expected to vary by latitude, ambient temperature and humidity. If virus transmission in temperate zones primarily occurs by aerosol, then hand hygiene interventions would be expected to be less effective.

Since the World Health Organization highlighted the need for controlled trials in formulating the use of non-pharmaceutical interventions in preventing influenza transmission in 2006 [10], various randomized controlled trials (RCTs) and systematic reviews [8, 18] on the effectiveness of hand hygiene interventions in reducing influenza and other respiratory virus infections have been published. By contrast, there are three existing meta-analyses assessing the effectiveness of hand hygiene interventions in preventing respiratory diseases, none of which focused on influenza viruses specifically [19–21]. This systematic review and meta-analysis aims to evaluate the impact of hand hygiene interventions in preventing influenza virus transmission in the community setting and to investigate the possible modifying effects of latitude, temperature and humidity on hand hygiene efficacy for influenza virus infection.

METHODS

This meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta Analyses recommendations (PRISMA) statement [22].

Search strategy

We searched the Medline (January 1946 to November 2013), PubMed (January 1960 to November 2013), EMBASE (1974 to November 2013), and Cochrane Library databases and the Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library, 2013, Issue 11) databases using the following search terms in all fields regardless of publication date and language:

#1: 'hand hygiene' OR 'hand washing' OR 'handwashing' OR 'hand-wash' OR 'hand sanitizers' OR 'hand sanitizer' OR 'hand rub'

#2: 'influenza' OR 'flu' OR 'respiratory infection' OR 'respiratory virus' OR 'respiratory tract infection' OR 'respiratory illness' OR 'fever' OR 'cough' OR 'sore throat' OR 'runny nose' OR 'nasal congestion' OR 'sneezing' OR 'malaise' OR 'muscle aches' OR 'headache'

#3: #1 AND #2

To identify further studies of interest, manual search was performed with the reference lists of retrieved review articles.

Eligibility criteria

We included any RCT comparing the effect of hand hygiene interventions with no intervention in reducing influenza virus transmission in community settings, in which study subjects or cluster units in a population were assigned prospectively into intervention and control groups using random allocation [23]. A community setting was defined as an open setting without confinement and special care for the participants. Articles describing any hand hygiene-related interventions alone were included.

Study selection

The primary outcome was the relative reduction of influenza virus infections confirmed by reverse-transcriptase–polymerase chain reaction (RT–PCR), virus culture or rapid antigen test in the hand hygiene intervention group compared to the control group. The secondary outcome measure was the relative reduction of influenza-like illnesses (ILI) confirmed by either professional clinical diagnosis or reported symptoms. We adopted a febrile acute respiratory illness (FARI) definition which defines cases as the presence of fever with cough or sore throat [24].

Two independent reviewers (V.W.Y.C., B.J.C.) screened all titles of studies identified by the search strategy individually, then subsequently reviewed the abstracts of the potential relevant studies. If the

studies described hand hygiene interventions and influenza transmission, the reviewers read the full-length text. Further discussion was held if a consensus was not reached.

Evidence quality assessment

We evaluated the methodological quality of each outcome with GRADEprofiler (GRADEpro) [25], as recommended by the Cochrane Collaboration. We ranked the quality of evidence of each outcome as high, moderate, low, and very low based on its risk of bias, consistency, directness, precision of the results and publication bias.

Statistical analysis

The effect estimates were summarized as risk ratios (RRs) and their corresponding 95% confidence intervals (CIs). Due to substantial variation in RRs, the summary statistic was estimated with the more conservative Mantel–Haenszel (MH) random-effects model since it accounts for both the potential variability in effects and also the random variability across studies associated with different study designs and settings. We assessed publication bias graphically with Begg's funnel plot [26] and also implemented Egger's test [27] and the Begg & Mazumdar rank correlation [26] to quantify the evidence of publication bias statistically. For Egger's test, we considered evidence of publication bias if the two-tailed P value was <0·05. For rank correlation, we considered evidence of publication bias if the two-tailed P value was <0·10 since this test statistic has been shown to be less sensitive than Egger's test [28]. We calculated the I^2 statistic to assess the extent of inconsistency for each pooled estimate. The I^2 statistic quantified the proportion of total variations across effect estimates due to heterogeneity but not sampling error, and ranges from 0% to 100% such that 0% indicates homogeneity and 100% reflects substantial heterogeneity [29].

We performed separate analyses of studies in developed and developing countries due to their systematic differences such as cultural background, educational level, etc., and performed a subgroup analysis of hand hygiene interventions with or without facemask use for both outcomes. Meta-regression was conducted to further assess if any covariates could explain the variation across studies in the effect of hand hygiene on laboratory-confirmed influenza, i.e. the primary outcome. To test for a modifying impact of temperature and humidity on efficacy of hand hygiene, we constructed univariate random-effects regression models with a number of covariates including latitude, average temperature and humidity during studies. We calculated the mean of the average temperature and relative humidity during the recorded study months by using the data provided by WeatherSpark [30], which is a weather website summarizing historical data for the world from the National Oceanic and Atmospheric Administration. We carried out the meta-analysis using RevMan version 5.1 software [31] and the Comprehensive Meta-analysis version 2 software [32].

RESULTS

Search results

We identified 979 articles in the initial database search, of which 41 were retrieved based on their title and abstract content. Of the 41 retrieved articles, ten were eligible for meta-analysis based on our inclusion criteria (see Fig. 1). We excluded 31 studies after the full-length assessment [33–63] for the following reasons: studies were not RCTs, ineligible definition on ILI, no definition on respiratory diseases outcomes, hand hygiene interventions as a part of infection control programme, or no control group (see online Appendix). The characteristics of the ten eligible RCTs are summarized in Table 1, which comprised nine studies assessing laboratory-confirmed influenza [64–72] and ten studies assessing ILI [64–73].

Quality of evidence

The methodological qualities of studies were assessed by GRADEpro. Studies that used a laboratory-confirmed influenza outcome were graded as high, while studies with an ILI-only outcome were graded as moderate. The evidence profile for each outcome is summarized in Table 2 (see also online Appendix). All included trials were RCTs with proper randomization and their allocation sequences were properly concealed. They were either single-blinded to the recruiting physician, principal investigator and statisticians or not blinded to any personnel. No significant publication bias was noted (see online Appendix). The imprecision was, however, significant in most of the trials due to small sample size, inadequate case ascertainment, poor compliance to interventions,

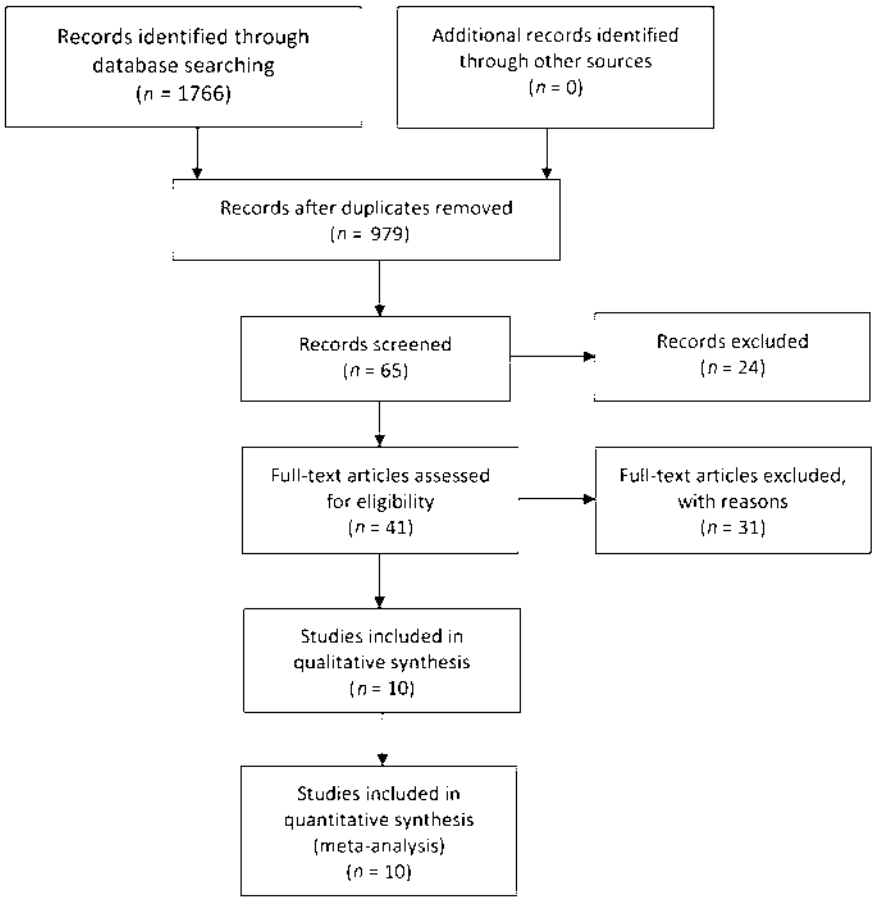

Fig. 1. Flow diagram of the process and results of study selection.

and insufficient statistical power. Most (8/10) of the studies received funding from the United States Centers for Disease Control and Prevention, one study was supported by the German Federal Ministry of Health, and one from a pharmaceutical company.

Efficacy of hand hygiene interventions

The forest plot for studies conducted in developed countries is shown in Figure 2. There was an insignificant relative risk reduction of 18% in the pooled analysis (RR 0·82, 95% CI 0·66–1·02, $I^2 = 0\%$, $P = 0{\cdot}07$) of laboratory-confirmed influenza outcome. While a significant reduction of 27% was reported for the hand hygiene and facemask group (RR 0·73, 95% CI 0·53–0·99, $I^2 = 0\%$, $P = 0{\cdot}05$), the hand hygiene only comparison was not statistically significant. A significant RR reduction of 22% (RR 0·78, 95% CI 0·68–0·90, $I^2 = 0\%$, $P = 0{\cdot}0008$) was found in the pooled analysis of ILI outcomes. In the subgroup analyses, similar to the result from the laboratory-confirmed influenza outcome, a significant reduction of 27% (RR 0·73, 95% CI 0·60–0·89, $I^2 = 0\%$, $P = 0{\cdot}002$) was noted for the combined comparison of hand hygiene and facemask use while the result from hand hygiene alone was not statistically significant.

There were only two studies in less developed countries. The efficacy of hand hygiene was not significant in the pooled analysis for the laboratory-confirmed influenza outcome. For the ILI outcome, a non-significant relative increase was observed for the efficacy of combined comparison of hand hygiene and facemask use (see online Appendix).

Meta-regression

We used meta-regression to explore if any particular covariate could explain the observed heterogeneity across studies (Table 3). A systematic review suggests that facemasks can reduce aerosol transmission of influenza virus [74]; therefore, we conducted meta-regression on hand hygiene interventions without facemask to assess the independent effects of hand

Table 1. *Characteristics of included studies*

Characteristics	No. of studies (%)
Country	
Developed	8 (80)
Developing	2 (20)
Latitude (degrees)	
⩽23·5	7 (70)
>23·5	3 (30)
Setting	
Household	5 (50)
Elementary school	2 (20)
University residential hall	2 (20)
Office	1 (10)
Transmission mode	
Primary	6 (60)
Secondary	4 (40)
Interventions evaluated*	
Hand sanitizer and facemask	4 (31)
Hand sanitizer, non-antibacterial soap and education	3 (23)
Hand sanitizer	2 (15)
Non-antibacterial soap and education	2 (15)
Non-antibacterial soap, education and facemask	1 (8)
Hand sanitizer, non-antibacterial soap, education and facemask	1 (8)
Outcome assessed*	
Laboratory-confirmed influenza	9 (50)
Influenza-like-illness	9 (50)

* Some studies assess more than one intervention and outcome.

hygiene even after adjusting for potential factors that could impact heterogeneity. For the studies conducted in developed countries, we found that a 10° rise in latitude [relative risk ratio (RRR) 1·28, 95% CI 0·91 1·79, $P=0·15$], average temperature (RRR 0·82, 95% CI 0·59–1·13, $P=0·22$) and average relative humidity (RRR 0·63, 95% CI 0·32–1·22, $P=0·17$) were not statistically significantly associated with a change in the efficacy of hand hygiene in developed countries but the direction of the estimate for relative humidity was consistent with the hypothesis that influenza transmission is predominately by aerosol in temperate zones while the virus is commonly transmitted by contact route in tropical areas (see online Appendix).

DISCUSSION

We examined the efficacy of hand hygiene interventions in preventing influenza virus transmission in the community. The subgroup analysis from developed countries suggested that a combined intervention consisting of hand hygiene with facemasks is an effective strategy to prevent influenza, but we did not confirm the efficacy of hand hygiene alone for reducing influenza illness. This is consistent with evidence on the important role of aerosol transmission of influenza, such that interventions against contact transmission alone like hand hygiene may not be sufficient to control influenza transmission in the community [75]. However, shortcomings related to statistical power to detect the impact of hand hygiene suggest that future studies should continue to study the impact of hand hygiene independently on laboratory-confirmed influenza outcomes.

Seasonal and pandemic influenza viruses cause a major burden of illness, hospitalization and death. Our review captured studies with the outcomes of laboratory-confirmed influenza or FARI (ILI) which is a fairly specific outcome to influenza. We did not include studies with broader definitions of respiratory illness, which could encompass many other outcomes such as other non-influenza viral infections, asthma exacerbation, allergic rhinitis or non-viral respiratory infections, because the efficacy of hand hygiene intervention on each respiratory illness might vary. According to these inclusion criteria, our review did not include studies that examined the efficacy of hand hygiene against broader respiratory illness outcomes, but these studies did identify reasonable efficacy of hand hygiene interventions [46, 54–56]. For this reason, this meta-analysis goes beyond three formerly published reviews [19 21] by focusing on influenza virus infections rather than any respiratory illness symptoms, and by exploring the hypothesis that modes of transmission may vary from region to region. In our meta-regression model, although we did not find any significant effects, we noted evidence for effects of all three covariates particularly from relative humidity. The insignificant result may due to relatively low sample size.

There are several noteworthy limitations in this review. The greatest limitation is the small number of RCTs that have been conducted to date on the efficacy of hand hygiene to control influenza. Since there are only a few studies involving the same hand hygiene interventions among the included studies, we are unable to provide intervention-specific pooled estimates. The efficacy of individual hand hygiene interventions, hence, cannot be compared. The heterogeneity across studies is another limitation and to address this

Table 2. *Grade evidence profile*

Quality assessment							No of patients		Effect			
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Hand hygiene *vs.* control (combined data)		Risk ratio (95% CI)	Absolute	Quality	Importance
Laboratory confirmed influenza (follow-up 2–19 months; assessed with nasal and/ or throat swab specimen collected for RT–PCR or Quick-Vue test)												
9	Randomized trial[1]	No serious risk of bias[2,3,4]	No serious inconsistency[5]	No serious indirectness[6]	Serious[7]	Strong association[8]	415/26 426 (1·6%)	613/29 440 (2·1%)	RR 0·79 (0·61–1·02)	5 fewer per 1000 (from 9 fewer to 1 more)	High	Critical
Clinically diagnosed influenza-like illness [follow-up 2–19 months; assessed with FARI definition (fever AND sore throat AND/OR cough)]												
10	Randomized trials[1]	No serious risk of bias[9,10,11]	No serious inconsistency[5]	No serious indirectness[12]	Serious[13]	None	2171/26 490 (8·2%)	3094/29 505 (10·5%)	RR 0·95 (0·77–1·17)	5 fewer per 1000 (from 24 fewer to 18 more)	Moderate	Important

CI, Confidence interval; FARI, febrile acute respiratory illness.
The superior numerical indicators refer to notes in Supplementary Table S2 (see online Appendix).

we performed separate analyses for developed and developing countries' data and meta-regression for hand hygiene only laboratory-confirmed influenza outcome. Although we cannot exclude the possible role of other covariates, we minimized the variations of different study design characteristics by including only RCTs. The variations associated with different settings and different hand hygiene interventions, however, cannot be ignored. The possible clustering effect may also be a limitation in our review. Since we did not adjust for clustering in the analysis, this may lead to skewed results with possibly higher risk of type I error and narrower confidence intervals. However, one previous study suggested that clustering effect did not have a significant effect on heterogeneity or overall pooled estimates from their meta-analysis assessing the effectiveness of hand hygiene interventions on infectious disease risk in the community setting [20].

The findings of this review have implications for the recommendations and guidelines of hand hygiene and facemask use in the future. Given the lack of substantial efficacy of hand hygiene identified in our review (Fig. 3), and the increasing evidence supporting a role of aerosol as a mode of influenza virus transmission [75–78], further public health initiatives may need to re-examine the control measures for aerosol transmission. In particular, measures such as hand hygiene that focus on reducing one mode of transmission (i.e. contact) may not be sufficient to control transmission. Measures that may require more detailed consideration include N95-type respirators, improved indoor ventilation, quarantining of infected individuals, and even the use of air humidifiers, given the potential role of humidity in reducing viability of aerosols [16, 17]. While elucidating the possible influence of humidity in influenza transmission among human populations further confirms its contribution on influenza seasonality, particularly in temperate regions, the detailed mechanisms have yet to be explored.

The insignificant findings from hand hygiene intervention alone and subgroup analyses from developing countries' data does not necessarily indicate that hand hygiene is an ineffective measure for preventing influenza virus transmission. Rather, the non-significant results for hand hygiene alone could raise questions on compliance with existing recommendations on hand hygiene in the community. Indeed, hand washing and sanitizing needs to be practised properly and after all potential critical contamination events

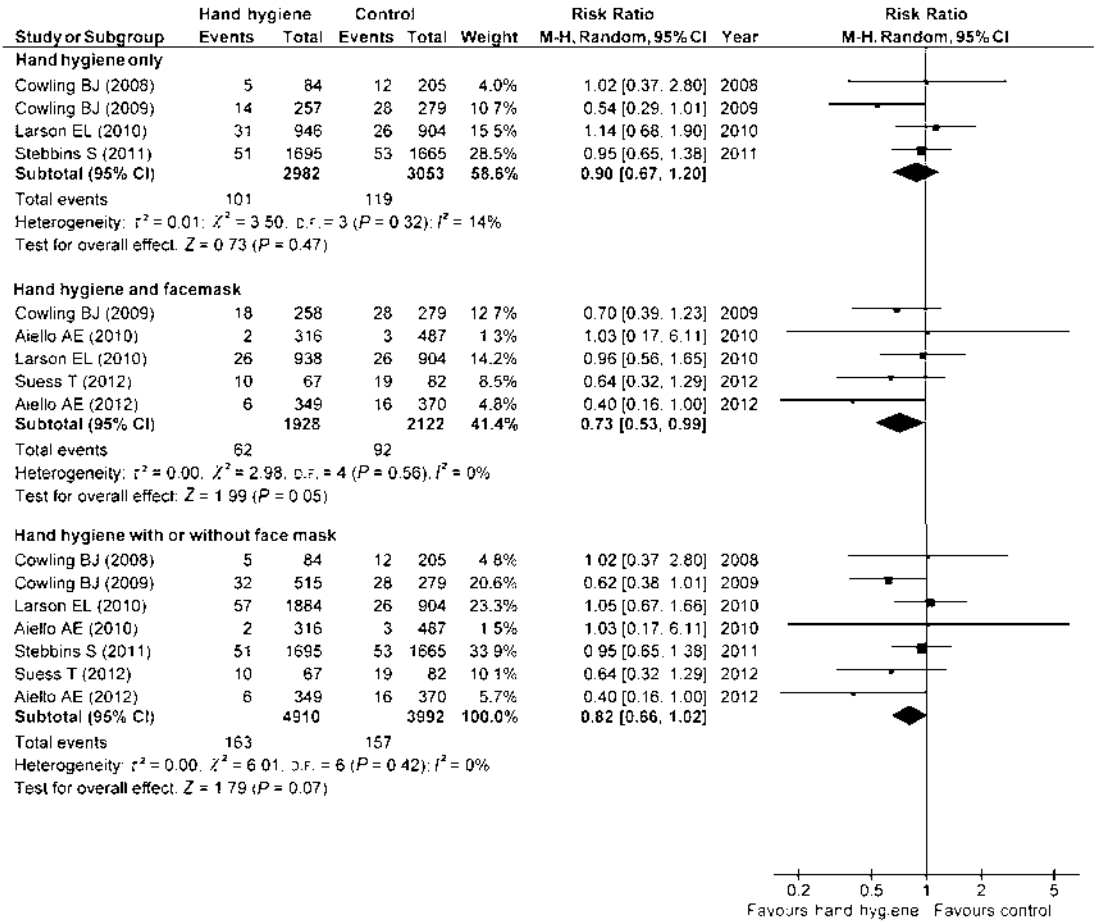

Fig. 2. Risk ratios for the effect of hand hygiene interventions with or without facemask on laboratory-confirmed influenza in studies conducted in developed countries.

that might occur throughout the day. The CDC recommends that individuals wash their hands with soap and water for at least 20 seconds, properly lathering hands, washing soap off, and drying hands completely or if a sink is not available, to use hand sanitizer when hands are not visibly soiled [15]. These recommendation are rarely carried out with high compliance in the general population [79]. Clearly, hand hygiene interventions not only need to be proven effective, but they also need to be widely adopted by most of the population if they are to mitigate influenza transmission effectively. Given the existing public health recommendations and guidelines on using hand hygiene interventions in preventing influenza transmission [11, 80, 81], the compliance rate in the community has not yet been well established. To our knowledge, there are only a few studies exploring interventions to promote hand hygiene practice in the community [82–86]. Further studies, in this regard, are warranted in relation to compliance rates of hand hygiene interventions and the possible interventions to promote such practices in the community.

In conclusion, hand hygiene interventions have been, and will continue to be an important component of the public health response to seasonal and pandemic influenza. However, expectations on the impact of such measures may need to be limited, given the results of our review indicating only potentially modest effects of this specific intervention. Variation in the importance of aerosol transmission in different regions is an intriguing possibility, and could imply the need for greater focus on alternative control measures particularly in temperate zones.

SUPPLEMENTARY MATERIAL

For supplementary material accompanying this paper visit http://dx.doi.org/10.1017/S095026881400003X.

Table 3. *Univariate regression analyses on different covariates in relation to the risk of laboratory-confirmed influenza in combined countries' data and developed countries' data (hand hygiene intervention only)*

Laboratory-confirmed influenza (combined data – hand hygiene intervention only)						
	Combined data (six studies)			Developed countries only (four studies)		
Covariates	RRR	95% CI	*P* value	RRR	95% CI	*P* value
Latitude (10° change)	1·00	0·66 1·54	0·984	1·28	0·91 1·79	0·145
Average temperature (10 °C change)	0·93	0·59 1·49	0·778	0·82	0·59 1·13	0·221
Average relative humidity (10 percentage point change)	1·20	0·89 1·63	0·227	0·63	0·32 1·22	0·169

RRR, Relative risk ratio; CI, confidence interval.

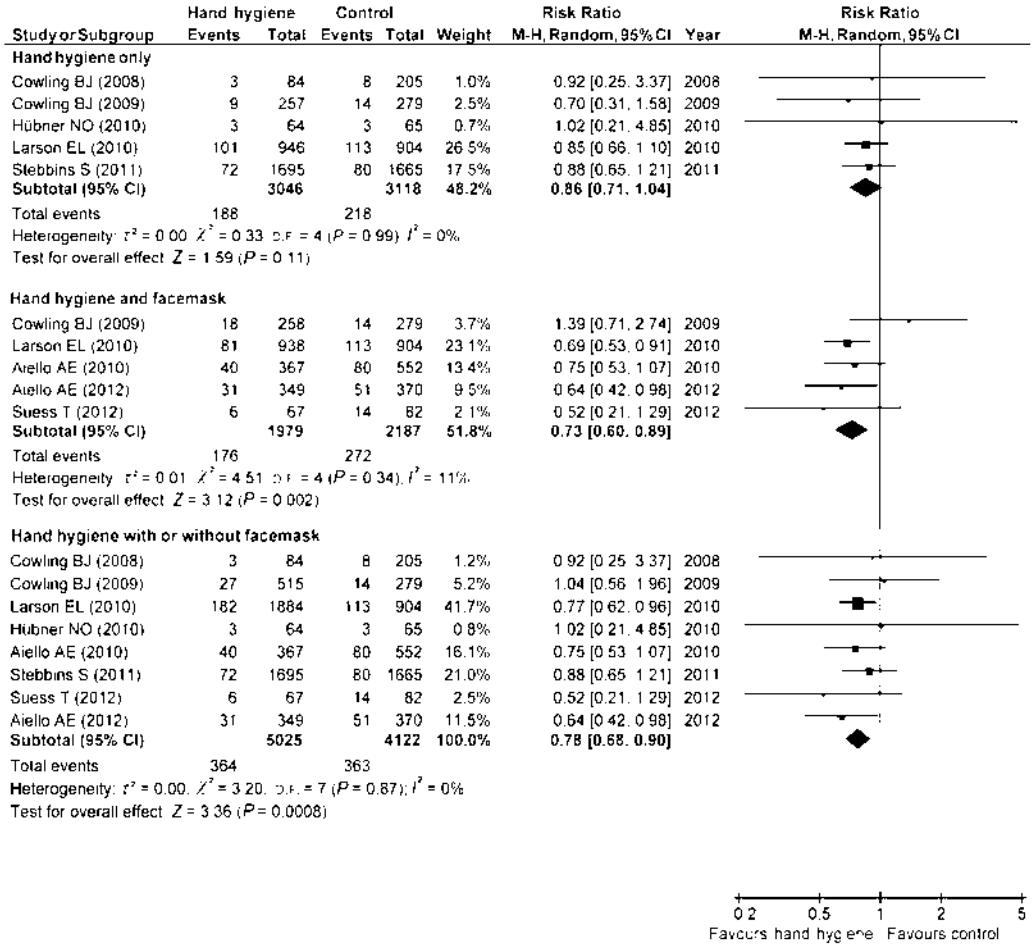

Fig. 3. Risk ratios for the effect of hand hygiene interventions with or without facemask on influenza-like illness in studies conducted in developed countries.

ACKNOWLEDGEMENTS

This work was supported by the Harvard Center for Communicable Disease Dynamics from the National Institute of General Medical Sciences (grant no. U54 GM088558), and the Area of Excellence Scheme of the Hong Kong University Grants Committee (grant no. AoE/M-12/06).

DECLARATION OF INTEREST

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From: O'Brien, Robert C. EOP/WHO
Sent: Tue, 24 Mar 2020 19:28:15 +0000
To: Pottinger, Matthew F. EOP/WHO;'Debi Birx';Redfield, Robert R. (CDC/OD);Short, Marc T. EOP/OVP;'AMA2 (OS/IOS) Alex Azar';Adams, Jerome (HHS/OASH);Kushner, Jared C. EOP/WHO;Liddell, Christopher P. EOP/WHO;Fauci, Anthony (NIH/NIAID) [E];Azar, Alex M. II EOP/WHO
Subject: RE: regarding masks and Covid-19

Dear Colleagues,

(b)(5)

Best,
RCO

Air travel significant to spread of COVID-19

- By Huang Chung-yuan, Chin Wei-chien 黃崇源，陳威全
-

- The second wave of COVID-19 in Taiwan is cause for increasing concern. For four consecutive days, starting on Monday, the government has announced new confirmed cases, including several members of a tour group who visited Turkey. Among 23 new cases that the Central Epidemic Command Center announced on Wednesday, four were members of that tour group. As of Thursday, only two individuals in the entire tour group have tested negative for the virus.
- Minister of Health and Welfare Chen Shih-chung (陳時中), who heads the center, has expressed concern over this cluster of infections.
- As of Thursday, Turkey and Egypt had reported only 191 and 210 confirmed COVID-19 cases respectively — fewer than those being reported throughout Europe and the US, so why is the positive diagnosis rate so high for this group of tourists? What factors should be considered when determining the degree of risk?
- Our research team has been running computer simulations of various diseases for many years, and we have conducted numerous evaluative studies of public health policies in response to the potential for emerging epidemic diseases. Based on our experience, we can offer a response and some advice.
- When simulating the transmission dynamics of an emerging epidemic disease, these programs execute hundreds or thousands of simulations to cover all possible circumstances and variables. They try to include factors that governments might not

anticipate, using variations of common transmission patterns, and making modifications in response to urgent or rare situations.

- These models consider many aspects of overseas travel, including flying, processing customs paperwork, checking in and retrieving luggage. The details of the international travel system are the same whether they occur in Turkey, Egypt, Europe, the US or any other country.
- Based on these factors and our experience, Chen is correct in asserting that this coronavirus can be found in the cabins of many airplanes, and therefore people should avoid flying. However, not enough emphasis is being placed on the roles of international airports in spreading COVID-19, due to the numerous passengers and many aircraft arriving for maintenance.
- From a statistical point of view, the probability of physically encountering the novel coronavirus or of being exposed to infected individuals in large international airports or in the cabins of airplanes is much higher than in homes, workplaces, schools or other public spaces.
- These pandemic simulations show that large international airports and airplane cabins are major sources of risk, and are high on the list of reasons COVID-19 has spread so widely and quickly.
- To protect the health of all individuals and their families, and to help the government delay the spread of COVID-19 in Taiwan, people must avoid all international air travel and airports during the pandemic.
- *Huang Chung-yuan is a professor at Chang Gung University's Graduate Institute of Computer Science and Information Engineering. Chin Wei-chien is a research fellow at Singapore University of Technology and Design.*

From: O'Brien, Robert C. EOP/WHO
Sent: Tuesday, March 24, 2020 9:30 AM
To: Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Debi Birx <BirxDL@state.gov>; Robert Redfield <olx1@cdc.gov>; Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; AMA2 (OS/IOS) Alex Azar <AMA2@hhs.gov>; jerome.adams@hhs.gov; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Anthony Fauci (b)(6) Azar, Alex M. II EOP/WHO <Alex.M.Azar@who.eop.gov>
Subject: RE: regarding masks and Covid-19

Thank you for the thoughtful note, Matt.

(b)(5)

(b)(5)

Warm regards,
RCO

From: Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>
Sent: Tuesday, March 24, 2020 6:38 AM
To: Debi Birx <BirxDL@state.gov>; Robert Redfield <olx1@cdc.gov>; Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; O'Brien, Robert C. EOP/WHO <rco84@who.eop.gov>; AMA2 (OS/IOS) Alex Azar <AMA2@hhs.gov>; jerome.adams@hhs.gov; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Anthony Fauci (b)(6)
Subject: Re: regarding masks and Covid-19

(b)(5)

Matt

Sent from my iPhone

On Mar 24, 2020, at 6:27 AM, Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov> wrote:

(b)(5)

Kong.
Best
Matt Pottinger
Deputy National Security Advisor.

Sent from my iPhone

Begin forwarded message:

From: KY Yuen <kyyuen@hku.hk>
Date: March 23, 2020 at 10:39:53 PM EDT
To: "Lyons, John" <john.lyons@wsj.com>
Subject: [EXTERNAL] Wall Street Journal question regarding masks and Covid-19

Dear John,

Thanks for your message.

i. Studies have shown that wearing a mask with frequent hand hygiene significantly reduced transmission of influenza virus (also an enveloped respiratory virus with high transmissibility) in a community setting. But once the use of surgical mask is removed, the effect of hand hygiene becomes insignificant. (see attached)

ii. Moreover, besides protecting yourself from this novel coronavirus or other respiratory viruses by wearing a mask, for those who are infected with this novel coronavirus asymptomatically (subclinical) or symptomatically, this will markedly reduce the amount of virus shedding in the saliva and respiratory droplet. This will therefore markedly reduce the community transmission. But the wearers must wear it correctly, learn to avoid touching the mask involuntarily and still observe good hand hygiene. This is not easy.

iii. Except for the rich people, millions of HK people are living in very small housing estate or subdivided flat of 60 square feet. Advice has to be pragmatic. We go out to work, exercise or hiking. The first thing is to go into a VERY crowded elevator, then into very crowded MTR or bus, then going up a crowded elevator to our office OR to the place of hiking and exercise, and the reverse order happens when we go home. If we take off a mask and throw it away every time when not in a crowded environment and put up a new mask when entering a crowded environment, we need to use at least 8 mask per day when lunch and dinner outside are counted. Thus all these advice by many authorities may not be pragmatic.

HK is the most densely populated city in the world. Before the epidemic, at least 0.1 million HK residents or tourists cross our mainland border every day carrying the virus with them into HK. If not for universal masking once we depart from our home every day and wearing it correctly with hand hygiene, HK would be like Korea and Italy LONG ago. We now achieve 250 confirmed cases per 7.5 million population. This is really a record and is BETTER than

other countries with a HOT weather and much less epidemic pressure from Chinese mainlanders.

Hope that this message will explain clearly why most medical colleagues in HK advocate universal masking once leaving their home. Note that the logistic of mask availability is another issue that requires other ways to work on.

Warm regards.
KY

From: Lyons, John [mailto:john.lyons@wsj.com]
Sent: Tuesday, March 24, 2020 10:16 AM
To: kyyuen@hku.hk
Subject: Wall Street Journal question regarding masks and Covid-19

Dear Professor Yuen,

I am a senior reporter at the WSJ based here in Hong Kong.

I am interested in your perspective for a story I am writing on whether "to mask or not to mask" in the fight against the new Coronavirus.

On the one hand, the WHO has said healthy people need not wear masks on the grounds that they are not effective if not properly used; may lead to a false sense of security; and could use up scarce supplies. On the other hand, many people, especially in Asia, see it as common sense a barrier will help contain the spread, especially when some carriers are asymptomatic. In Hong Kong, the experience of successfully fighting SARS seems to add evidence that masks are a good idea.

I can be reached at 6281 3512. I am trying to finish the story today. It will run in the newspaper and on our website globally.

Best,

John

--

John Lyons
The Wall Street Journal.
Hong Kong Cell: +(852) 6281.3512

<hand_hygiene_and_risk_of_influenza_virus_infections_in_the_community_a_systematic_review_and_metaanalysis.pdf>

From: Staff Secretary
Sent: Wed, 25 Mar 2020 17:14:49 +0000
To: Liddell, Christopher P. EOP/WHO;Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Kushner, Jared C. EOP/WHO;Harrison, Brian (HHS/IOS);Fauci, Anthony (NIH/NIAID) [E];Birx, Deborah L. EOP/NSC;Redfield, Robert R. (CDC/OD);Hutchinson, Cassidy J. EOP/WHO;Moore, Caroline E. EOP/WHO;Pottinger, Matthew F. EOP/WHO;Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;'Mizelle, Chad';Ueland, Eric M. EOP/WHO;Kudlow, Larry A. EOP/WHO;Grogan, Joseph J. EOP/WHO;Grisham, Stephanie A. EOP/WHO;Hicks, Hope C. EOP/WHO;Gidley, Hogan H. EOP/WHO;Deere, Judd P. EOP/WHO;Ditto, Jessica E. EOP/WHO;Hahn, Julia A. EOP/WHO;Rinat, Ory S. EOP/WHO;Vought, Russell T. EOP/OMB;Ornato, Tony M. EOP/WHO;Levi, William (OAG);imt@who.eop.gov;Conway, Kellyanne E. EOP/WHO;Hoelscher, Douglas L. EOP/WHO;Pataki, Tim A. EOP/WHO
Cc: Staff Secretary
Subject: FLASH CLEARANCE: First Responders Guidance
Attachments: COVID_8.5x11_EssentialWorkers_Employers_upd title and Do.pdf

All,

Attached for your FLASH review is a draft document from CISA clarifying guidance for first responders. The goal would be for the agencies to release today after getting feedback form stakeholders on an afternoon call, and then the President would likely speak to it tomorrow. In order to facilitate that timeline, we respectfully request your comments and feedback by **2:30pm today.** Affirmative clearance is requested from **NSC, OVP, HHS, and DHS**, though all are welcome to comment.

Thank you,
Staff Secretary

(b)(5)

From: Staff Secretary
Sent: Wed, 25 Mar 2020 21:50:20 +0000
To: Liddell, Christopher P. EOP/WHO;Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Kushner, Jared C. EOP/WHO;Harrison, Brian (HHS/IOS);Fauci, Anthony (NIH/NIAID) [E];Birx, Deborah L. EOP/NSC;Redfield, Robert R. (CDC/OD);Hutchinson, Cassidy J. EOP/WHO;Moore, Caroline E. EOP/WHO;Pottinger, Matthew F. EOP/WHO;Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;'Mizelle, Chad';Ueland, Eric M. EOP/WHO;Kudlow, Larry A. EOP/WHO;Grogan, Joseph J. EOP/WHO;Grisham, Stephanie A. EOP/WHO;Hicks, Hope C. EOP/WHO;Gidley, Hogan H. EOP/WHO;Deere, Judd P. EOP/WHO;Ditto, Jessica E. EOP/WHO;Hahn, Julia A. EOP/WHO;Rinat, Ory S. EOP/WHO;Vought, Russell T. EOP/OMB;Ornato, Tony M. EOP/WHO;Levi, William (OAG);imt@who.eop.gov;Conway, Kellyanne E. EOP/WHO;Hoelscher, Douglas L. EOP/WHO;Pataki, Tim A. EOP/WHO
Cc: Staff Secretary
Subject: For Review: First Responders Guidance
Attachments: COVID_8.5x11_EssentialWorkers_Employers_v4.pdf

All,

Updated guidance is attached. Note that the timeline for this has eased a bit, so please send any final edits **by 1pm tomorrow.**

Thank you,
Staff Secretary

From: Staff Secretary
Sent: Wednesday, March 25, 2020 1:15 PM
To: Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; 'Harrison, Brian (HHS/IOS)' <Brian.Harrison@hhs.gov>; 'Fauci, Anthony (NIH/NIAID) [E]' (b)(6) Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; 'olx1@cdc.gov' <olx1@cdc.gov>; Hutchinson, Cassidy J. EOP/WHO <Cassidy.J.Hutchinson2@who.eop.gov>; Moore, Caroline E. EOP/WHO <Caroline.E.Moore@who.eop.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Philbin, Patrick F. EOP/WHO <pfp2dcp@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; 'Mizelle, Chad' <chad.mizelle@hq.dhs.gov>; Ueland, Eric M. EOP/WHO <Eric.M.Ueland@who.eop.gov>; Kudlow, Larry A. EOP/WHO <Lawrence.A.Kudlow@who.eop.gov>; Grogan, Joseph J. EOP/WHO <Joseph.J.Grogan@who.eop.gov>; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; 'Gidley, Hogan H. EOP/WHO' <Hogan.Gidley@who.eop.gov>; Deere, Judd P. EOP/WHO <Judson.P.Deere@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Hahn, Julia A. EOP/WHO <Julia.A.Hahn@who.eop.gov>; Rinat, Ory S. EOP/WHO <Ory.S.Rinat@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; 'Levi, William (OAG)' <William.Levi@usdoj.gov>; imt@who.eop.gov; Conway, Kellyanne E. EOP/WHO <KAC@who.eop.gov>; Hoelscher, Douglas L. EOP/WHO <Douglas.L.Hoelscher@who.eop.gov>; Pataki, Tim A. EOP/WHO <Timothy.A.Pataki@who.eop.gov>

Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: FLASH CLEARANCE: First Responders Guidance

All,

Attached for your FLASH review is a draft document from CISA clarifying guidance for first responders. The goal would be for the agencies to release today after getting feedback form stakeholders on an afternoon call, and then the President would likely speak to it tomorrow. In order to facilitate that timeline, we respectfully request your comments and feedback by **2:30pm today.** Affirmative clearance is requested from **NSC, OVP, HHS, and DHS**, though all are welcome to comment.

Thank you,
Staff Secretary

(b)(5)

From: CMS SV1
Sent: Fri, 27 Mar 2020 17:10:36 +0000
To: Short, Marc T. EOP/OVP;Troye, Olivia (nsc.eop.gov);Grogan, Joseph J. EOP/WHO;Deborah.L.Birx@nsc.eop.gov;Redfield, Robert R. (CDC/OD);Giroir, Brett (HHS/OASH);Gaynor, Pete (fema.dhs.gov);Cipollone, Pat A. EOP/WHO;adam@dfc.gov;'Kushner, Jared C. EOP/WHO'
Subject: PLEASE REVIEW: HOSPITAL LETTER. PREDECISIONAL, CONFIDENITAL, DELIBERATIVE
Attachments: OVP Letter to Hospitals Requesting Data 3.27.20.docx

(b)(5)

From: Brookes, Brady (CMS/OA)
Sent: Friday, March 27, 2020 12:22 PM
To (b)(6) @cms.hhs.gov>
Subject: Draft Letter

Confidential and deliberative, pre-decisional communication

b(5) (PCP)

b(5) (PCP)

From: CMS SV1
Sent: Sat, 28 Mar 2020 23:47:34 +0000
To: Gaynor, Pete (fema.dhs.gov);Adams, Jerome (HHS/OASH);'adam@dfc.gov';'Kushner, Jared C. EOP/WHO';Redfield, Robert R. (CDC/OD);'Grogan, Joseph J. EOP/WHO'
Subject: FW: Data Reporting to Hospitals
Attachments: NHSN COVID-19 Patient Impact and Hospital Capacity Module- Data Elements Table of Instructions.pdf, NHSN COVID-19 Patient Impact and Hospital Capacity Module - How to Use the Module.pdf

(b)(5)

From: Brookes, Brady (CMS/OA) <Brady.Brookes@cms.hhs.gov>
Sent: Saturday, March 28, 2020 7:43 PM
To: (b)(6) @cms.hhs.gov>
Subject: Data Reporting to Hospitals

https://www.cdc.gov/nhsn/acute-care-hospital/covid19/index.html

Confidential and deliberative, pre-decisional communication

b(5) (PCP)

b(5) (PCP)

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b(5) (PCP)

b(5) (PCP)

b(5) (PCP)

b(5) (PCP)

b(5) (PCP)

b(5) (PCP)

b(5) (PCP)

From: Birx, Deborah L. EOP/NSC
Sent: Sun, 29 Mar 2020 17:02:51 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Redfield, Robert R. (CDC/OD);Short, Marc T. EOP/OVP;Liddell, Christopher P. EOP/WHO;Kushner, Jared C. EOP/WHO
Subject: Final for briefing
Attachments: PresidentialGuidance-UPDATED final.ppt

(b)(5)

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(b)(5)

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(b)(5)

From: Keller, Catherine B. EOP/WHO
Sent: Sun, 15 Mar 2020 17:08:31 +0000
To: Fauci, Anthony (NIH/NIAID) [E];Short, Marc T. EOP/OVP;Miller, Katie R. EOP/OVP;Conway, Kellyanne E. EOP/WHO;Kudlow, Larry A. EOP/WHO;Harrison, Brian (HHS/IOS);Redfield, Robert R. (CDC/OD);Philbin, Patrick F. EOP/WHO;Eisenberg, John A. EOP/WHO;Kushner, Jared C. EOP/WHO;Birx, Deborah L. EOP/NSC;Troye, Olivia EOP/NSC;Pottinger, Matthew F. EOP/WHO;Vought, Russell T. EOP/OMB;Zachary.McEntee@treasury.gov;Hicks, Hope C. EOP/WHO;'Mizelle, Chad';imt@who.eop.gov;Levi, William (OAG;Ornato, Tony M. EOP/WHO;Rinat, Ory S. EOP/WHO;Liddell, Christopher P. EOP/WHO;Grogan, Joseph J. EOP/WHO;McEntee, John D. II EOP/WHO;Pataki, Tim A. EOP/WHO;Hoelscher, Douglas L. EOP/WHO;Grisham, Stephanie A. EOP/WHO;Ditto, Jessica E. EOP/WHO;Ueland, Eric M. EOP/WHO;Stewart, Jennifer SES SD
Cc: Staff Secretary
Subject: RE: QUICK Review: Coronavirus TF - Social Distancing Recs
Attachments: Social Distancing v3 Edits.pptx

All,

A revised draft is attached, subject to formatting. Please send any further feedback you may have as soon as possible, but **no later than 2pm today.**

From: Keller, Catherine B. EOP/WHO
Sent: Sunday, March 15, 2020 10:09 AM
To: 'Fauci, Anthony (NIH/NIAID) [E]' (b)(6) Short, Marc T. EOP/OVP <Marc.T.Short@ovp.eop.gov>; Miller, Katie R. EOP/OVP <Katie.R.Miller@ovp.eop.gov>; 'Harrison, Brian (HHS/IOS)' <Brian.Harrison@hhs.gov>; 'olx1@cdc.gov' <olx1@cdc.gov>; Philbin, Patrick F. EOP/WHO <pfp2dcp@who.eop.gov>; Eisenberg, John A. EOP/WHO <John.A.Eisenberg@who.eop.gov>; Kushner, Jared C. EOP/WHO <jck@who.eop.gov>; Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Troye, Olivia EOP/NSC <Olivia.Troye@nsc.eop.gov>; Pottinger, Matthew F. EOP/WHO <MPottinger@who.eop.gov>; Vought, Russell T. EOP/OMB <Russell.T.Vought@omb.eop.gov>; 'Zachary.McEntee@treasury.gov' <Zachary.McEntee@treasury.gov>; Hicks, Hope C. EOP/WHO <Hope@who.eop.gov>; 'Mizelle, Chad' <chad.mizelle@hq.dhs.gov>; imt@who.eop.gov; 'Levi, William (OAG' <William.Levi@usdoj.gov>; Ornato, Tony M. EOP/WHO <Anthony.Ornato@who.eop.gov>; Rinat, Ory S. EOP/WHO <Ory.S.Rinat@who.eop.gov>; Liddell, Christopher P. EOP/WHO <Christopher.P.Liddell@who.eop.gov>; Grogan, Joseph J. EOP/WHO <Joseph.J.Grogan@who.eop.gov>; McEntee, John D. II EOP/WHO <John.D.McEntee2@who.eop.gov>; Pataki, Tim A. EOP/WHO <Timothy.A.Pataki@who.eop.gov>; Hoelscher, Douglas L. EOP/WHO <Douglas.L.Hoelscher@who.eop.gov>; Grisham, Stephanie A. EOP/WHO <Stephanie.A.Grisham@who.eop.gov>; Ditto, Jessica E. EOP/WHO <Jessica.E.Ditto@who.eop.gov>; Ueland, Eric M. EOP/WHO <Eric.M.Ueland@who.eop.gov>
Cc: Staff Secretary <staffsecretary@who.eop.gov>
Subject: QUICK Review: Coronavirus TF - Social Distancing Recs
Importance: High

All,

Please see attached for draft recommendations on Social Distancing. Please send any feedback you have by **11:15am today.** Thank you.

(b)(5)

(b)(5)

(b)(5)

From: Kushner, Jared C. EOP/WHO
Sent: 15 Mar 2020 13:53:46 +0000
To: Nat Turner
Cc: Birx, Deborah L. EOP/NSC;Redfield, Robert R. (CDC/OD)
Subject: Re: [EXTERNAL] Updated deck on social distancing recommendations

(b)(5)

Sent from my iPhone

On Mar 15, 2020, at 9:25 AM, Nat Turner <(b)(6) wrote:

Dr. Birx - see attached for the updated deck. (b)(5)
(b)(5)
(b)(5) Please let me know if you have any questions or additional feedback.

Thanks

-Nat

<Social Distancing v3.pptx>

From: Kushner, Jared C. EOP/WHO
Sent: 15 Mar 2020 14:50:08 +0000
To: Redfield, Robert R. (CDC/OD)
Cc: Nat Turner;Birx, Deborah L. EOP/NSC
Subject: Re: [EXTERNAL] Updated deck on social distancing recommendations

(b)(5)

Sent from my iPhone

On Mar 15, 2020, at 10:44 AM, Redfield, Robert R. (CDC/OD) <olx1@cdc.gov> wrote:

(b)(5)

Get Outlook for iOS

From: Kushner, Jared C. EOP/WHO <jck@who.eop.gov>
Sent: Sunday, March 15, 2020 9:53:46 AM
To: Nat Turner (b)(6)
Cc: Birx, Deborah L. EOP/NSC <Deborah.L.Birx@nsc.eop.gov>; Redfield, Robert R. (CDC/OD) <olx1@cdc.gov>
Subject: Re: [EXTERNAL] Updated deck on social distancing recommendations

(b)(5)

Sent from my iPhone

On Mar 15, 2020, at 9:25 AM, Nat Turner (b)(6) wrote:

Dr. Birx - see attached for the updated deck. (b)(5)

(b)(5)

(b)(5) Please let me know if you have any questions or additional feedback.

Thanks

-Nat

<Social Distancing v3.pptx>