

From: [Genevieve Lanz](#)
To: [DNV Input](#)
Subject: FW: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf
Date: March 16, 2021 9:08:19 AM
Attachments: [image001.png](#)
[image002.png](#)
[Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf](#)

Forwarded for the record.

From: [REDACTED]
Sent: March 15, 2021 10:29 PM
To: Mayor and Council - DNV <Council@dnv.org>; James Gordon <gordonja@dnv.org>
Cc: [REDACTED]
Subject: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf

Dear Mayor, Council and Staff,

I admit that I am not an expert on municipal law or the drafting thereof – but If you will recall this letter I sent on March 8th detailing how back on October 19th 2020 Council did NOT direct staff to draft a new bylaw but instead directed staff to reinstate the old keeping of pigeons bylaw from 1971.

I had assumed that in this week delay that you would have figured out how to remedy that situation?

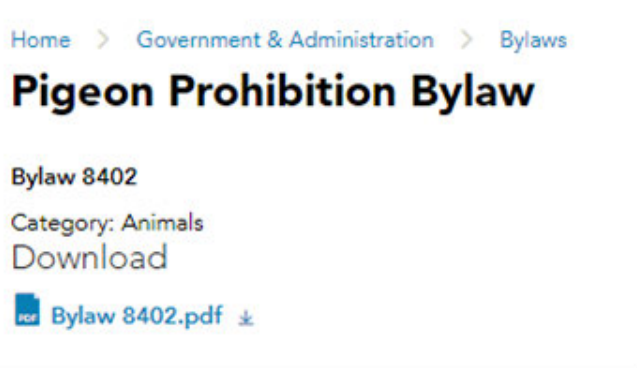
Why was 4078 not reinstated after October 19th and why does 8402 still show on the DNV Website as in-effect?

Where was the motion to “amend Council’s October 19th 2020 directive and instead direct staff to draft this new bylaw?”

Am I grossly naïve or have we completely ignored both due process and Robert’s Rules here?

So some questions come to mind:

A) Was bylaw 8402 in fact repealed on October 19th 2020? Because I just downloaded a copy of it from DNV.org where it showed as follows:



And the PDF copy shows the date in effect and no “repealed” notation of any kind.

[REDACTED]

B) Why is bylaw 4078 NOT available on DNV.org?

Search for a bylaw

Keywords or Bylaw Number

4078

Filter by Category

- Any -

Search

No Results

C) Why was tonight's motion NOT to "repeal bylaw 4078 and replace with proposed bylaw 8470"?

Now, please educate me, because either this stuff matters not at all, and please explain why it doesn't, or it is of utmost importance and this Council just blew a massive hole in process, Roberts Rules, procedures, etc.

Which one is it?

And let me see if I understand.... It was the original July 8, 2019 process that a majority of you contend was flawed, correct? Flawed more than this????

I am confused.

Please explain this to me.

Peter Teevan

Monday, March 8, 2021

Dear Mayor, Council and Municipal Clerk,

RE: Item 8.11 - new Keeping of Pigeons Bylaw

I write to you on the subject of tonight's Agenda Item 8.11 – the "New" Keeping of Pigeons Bylaw.

As you would expect, I was present during the October 19th, 2020 meeting of Council where the four members of Council who co-authored the report, moved and then passed the motion to repeal the Prohibition of Pigeons Bylaw and to reinstate the old Keeping of Pigeons Bylaw #4078.

While during that meeting the concept of drafting a new bylaw was raised by the Chair, the motion was NOT amended, and the motion was passed. Please see below my extracts from the October 19th agenda, and the minutes of that meeting which were passed during the November 16th meeting of Council:

Yet, for some reason, tonight's agenda says the following:

REASON FOR REPORT:

*At the regular meeting on October 19, 2020, **Council directed staff to prepare a bylaw regarding the keeping of pigeons for Council consideration.** This report introduces the Pigeon Regulation Bylaw (Attachment 1) to regulate the keeping of pigeons in a manner that is safe, sanitary, and humane, while also sensitive to the needs of neighbouring properties. Accompanying the Pigeon Regulation Bylaw are amendments to the Bylaw Notice Enforcement Bylaw (Attachment 2) to establish penalties associated with the regulations.*

The problem is, that is NOT what Council directed staff to do! Council directed staff to **"repeal the pigeon prohibition bylaw and reinstate the old keeping of pigeons bylaw:**

From October 19th's agenda:

Recommendation:

THAT staff are directed to repeal Pigeon Prohibition Bylaw 8402, 2019 and replace the bylaw with Bylaw 4078 Keeping of Pigeons Bylaw.

The District of North Vancouver REPORT TO COUNCIL

October 7, 2020

File:

AUTHOR: Jordan Back, Mathew Bond, Megan Curren, Jim Hanson

SUBJECT: Repeal Bylaw 8402 and Replace with Bylaw 4078

RECOMMENDATION:

THAT staff are directed to repeal "Pigeon Prohibition Bylaw 8402, 2019" and replace the bylaw with Bylaw 4078 "Keeping of Pigeons Bylaw".

REASON FOR REPORT:

The community and members of Council have expressed concerns over the process of the adoption of "Pigeon Prohibition Bylaw 8402, 2019".

BACKGROUND:

Outline of events are available publicly in the February 2020 report from David Loukidelis QC, in *Review of Adoption of District of North Vancouver Bylaw 8402* as well as through multiple freedom-of-information requests and news reports.

EXISTING POLICY:

The existing policy is "Pigeon Prohibition Bylaw 8402, 2019".

Options:

1. That staff are directed to repeal "Pigeon Prohibition Bylaw 8402, 2019" and replace the bylaw with Bylaw 4078 "Keeping of Pigeons Bylaw".

Respectfully submitted,

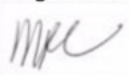
Councillor
Jordan Back



Councillor
Mathew Bond



Councillor
Megan Curren



Councillor
Jim Hanson



And then from the November 16th meeting - the approved minutes of October 19th:

MOVED by Councillor CURREN

SECONDED by Councillor BOND

THAT staff are directed to repeal Pigeon Prohibition Bylaw 8402, 2019 and replace the bylaw with Bylaw 4078 Keeping of Pigeons Bylaw.

CARRIED

Absent for Vote: Councillor FORBES and MURI

So then, how did staff see fit to defy the Council directive, use staff time to draft a new bylaw, consult with "stakeholders" - who by the way, are presumably also either parties to, or witnesses to the pending court cases, and then draft a whole new bylaw?

One would be led to think that there is another process going on here, other than the public one that we see during Council Meetings. Accordingly, I have submitted an FOI Request that I might discover what that process might be.

I would like to point out that it seems to me that every step that has been taken so far has brought all of us deeper and deeper into the mire. Every step has been a mistake. Contrary to advice to not interfere with the two pending court cases related to this affair – every step has, in very material ways, interfered by offering new testimony and therefore evidence to those cases.

One large misstep, in my opinion, was that October 7th, 2020 Report to Council by Councillors Back, Bond, Curren & Hanson – all who co-authored the report and co-signed it, obviously in person because we see their original signatures on the same document. Did that event not constitute an ad-hoc closed (Secret) Meeting of Council?

And now we have tonight's agenda – in defiance of the Council resolution of October 19th, 2020 to "reinstate bylaw 4078" we see ample evidence that, at some "secret meeting", of which no public notice was made, nor public input allowed, a decision was made to ignore the order of Council to reinstate the old bylaw and instead to draft a new one.

You must understand that such things belie the validity of the Public Meeting Process itself! If Public Meeting resolutions of Council can just be ignored, changed, redirected – then the Public Process is just a sham – an act, for display, while the "real business" occurs behind closed doors.

Then there is the no-less-importance subject of whether any of these missteps constitutes an interference with the process of the Courts on the two pending cases related to this. I can tell you that at these meetings I have witnessed statements by all of you, that if I were the lawyers involved, I would spend considerable time examining and cross-examining under oath.

I was surprised when this item was included in the agenda package, I will be surprised if it is not stricken from tonight's agenda before the meeting, and I implore you to do so.

To not do so would be to further interfere with the outcome of two pending Supreme Court cases and would be to further make invalid the Public Meeting process itself.

Quite sincerely,

Peter Teevan

A black rectangular redaction box covering the signature area.

From: [Genevieve Lanz](#)
To: [DNV Input](#)
Subject: FW: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf
Date: March 16, 2021 9:11:27 AM
Attachments: [image001.png](#)
[image002.png](#)

For the record.

From: Mike Little, Mayor <LittleM@dnv.org>
Sent: March 16, 2021 1:54 AM
To: Mayor and Council - DNV <Council@dnv.org>; James Gordon <gordonja@dnv.org>; pteevan@shaw.ca
Cc: [REDACTED]
Subject: Re: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf

Thanks for your note Peter,

Yes, the direction was to repeal and replace with the original bylaw, but then Dave Stuart said that he would prefer for staff to prepare an alternate motion which was a modified version of the original bylaw without the outdated language and that was brought forward as a staff recommendation, which was advanced at tonight's meeting. If council members were not satisfied with the alternative I am sure it would have been rejected but it wasn't. The will of the room was served, which is a funny Robert's Rules way of saying that sometimes a motion imperfectly catches the intent of the mover and an alternative, which was acceptable to the participants was put forward despite the specificity of the previous motion. We could roll back and change the earlier direction, or we can accept the alternative and move on with the matter. Council appears to have accepted the alternative.

Mike

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From: [REDACTED]
Sent: Monday, March 15, 2021 10:28:47 PM
To: Mayor and Council - DNV <[Council@dnv.org](#)>; James Gordon <[gordonja@dnv.org](#)>
Cc: [REDACTED]
Subject: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf

Dear Mayor, Council and Staff,

I admit that I am not an expert on municipal law or the drafting thereof – but If you will recall this letter I sent on March 8th detailing how back on October 19th 2020 Council did NOT direct staff to draft a new bylaw but instead directed staff to reinstate the old keeping of pigeons bylaw from 1971.

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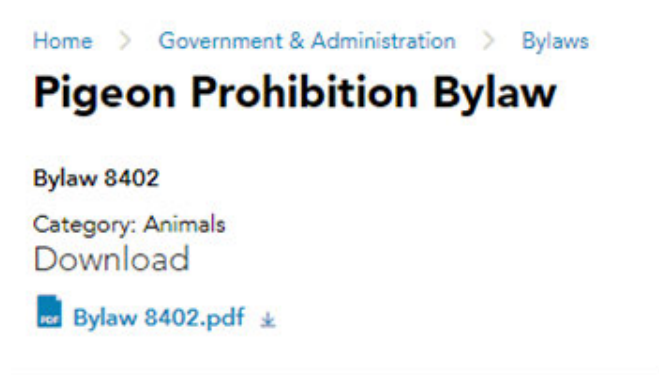
effect?

Where was the motion to “amend Council’s October 19th 2020 directive and instead direct staff to draft this new bylaw?”

Am I grossly naïve or have we completely ignored both due process and Robert’s Rules here?

So some questions come to mind:

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Search for a bylaw

Keywords or Bylaw Number	Filter by Category	
<input type="text" value="4078"/>	<input type="text" value="- Any -"/>	<input type="button" value="Search"/>

No Results

- C. Why was tonight’s motion NOT to “repeal bylaw 4078 and replace with proposed bylaw 8470”?

Now, please educate me, because either this stuff matters not at all, and please explain why it doesn’t, or it is of utmost importance and this Council just blew a massive hole in process, Roberts Rules, procedures, etc.

Which one is it?

And let me see if I understand.... It was the original July 8, 2019 process that a majority of you contend was flawed, correct? Flawed more than this????

I am confused.

Please explain this to me.

Peter Teevan

From: [Genevieve Lanz](#)
To: [Mayor and Council - DNV](#)
Cc: [DNV Input](#)
Subject: FW: Letter from Abraham Alizadeh re Proposed Pigeon Bylaw
Date: March 16, 2021 9:12:42 AM
Attachments: [DNVPigeonLetter.docx](#)

The attached is provided for information.

From: barbara alizadeh [REDACTED]
Sent: March 15, 2021 11:38 AM
To: Erin Bishop <bishope@dnv.org>
Subject: Letter from Abraham Alizadeh re Proposed Pigeon Bylaw

Hi Erin

I am attaching a letter that Abraham has written with his comments regarding the Proposed Pigeon Bylaw.

We signed up to view the Council meeting on March 8th but the meeting was cancelled due to a problem with Zoom, do you know when the next meeting will held?

Please do not hesitate to contact us if we can help in anyway with this matter.

Regards
Barbara & Abraham Alizadeh
[REDACTED]

From: Abraham Alizadeh

To: Erin Bishop, Property Use Business Licence Co-ordinator,DNV

I reviewed the proposed “Bylaw to Regulate the Keeping Pigeons” and found it very comprehensive. I only would like to make few comments/suggestions.

- 1) Enclosures (lofts): under this new proposal,
Basically 2 main requirements to be considered:
 - a) A loft height of 6-7 feet height enabling pigeon movement
 - b) Adequate perches available for birds to roost
- 2) “3.0 meters from an interior lot line”, currently houses are built 5-6 feet from the property line, is it necessary for pigeon lofts to should exceed this.
- 3) Number of pigeons allowed (20) is rather limited and the following issues should be considered
 - a) Loss to birds of prey
 - b) Loss to bad weather
 - c) Loss during training of young birds
 - d) Number of birds generally increases during breeding season (Spring and Summer)
 - e) Birds are broken down into three categories, breeding pairs, young birds and old birds. The breeding pairs do not generally fly during the period they breed, the young ones require older birds to teach them how to fly together and return to the loft. The pigeon fancier trains pigeons to come to his call and as the older birds are trained the younger ones follow the older birds and learn to associate the call with returning to the loft.
 - f) There is a difference between pigeons in their flying habits that could decide the number to be allowed in the bylaw. Homing pigeons are more solitary in their flying as they are bred for long distance flying. Fancy pigeons usually fly very little as they are bred for looks not flying ability and high-flyer pigeons fly in a tight group, they go high and stay in the boundaries of their home coup, because they fly so tightly together this helps to deter the birds of prey.

I am [REDACTED] years old and kept pigeons as hobby for [REDACTED] years. The pigeon keeping has given me many happy hours and definitely helped me to [REDACTED]. In 1979 I wrote a detailed paper about keeping pigeons for Oxford Polytechnic which I'll be happy to share with you. I also write articles for various pigeon clubs sharing my experience regarding pigeon health and management.

I would like to thank the council in advance for their time and effort reviewing my suggestions.

From: [Genevieve Lanz](#)
To: [DNV Input](#)
Subject: FW: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf
Date: March 16, 2021 11:21:24 AM
Attachments: [image001.png](#)
[image002.png](#)

Forwarded for the record.

From: Corrie Kost [REDACTED]
Sent: March 16, 2021 11:06 AM
To: Mike Little, Mayor <LittleM@dnv.org>; Mayor and Council - DNV <Council@dnv.org>; James Gordon <gordonja@dnv.org> [REDACTED]
Subject: Re: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf

Dear Mayor Mike Little,

Your explanation sounds rational. I only wish the "process" had been documented so that members of the public could see the rationale. Not a transparent process at all! As I have stated before - process and optics are important.

Yours truly,
Corrie Kost

Mike Little, Mayor wrote:

Thanks for your note Peter,

Yes, the direction was to repeal and replace with the original bylaw, but then Dave Stuart said that he would prefer for staff to prepare an alternate motion which was a modified version of the original bylaw without the outdated language and that was brought forward as a staff recommendation, which was advanced at tonight's meeting. If council members were not satisfied with the alternative I am sure it would have been rejected but it wasn't. The will of the room was served, which is a funny Robert's Rules way of saying that sometimes a motion imperfectly catches the intent of the mover and an alternative, which was acceptable to the participants was put forward despite the specificity of the previous motion. We could roll back and change the earlier direction, or we can accept the alternative and move on with the matter. Council appears to have accepted the alternative.

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From: [REDACTED]
Sent: Monday, March 15, 2021 10:28:47 PM
To: Mayor and Council - DNV <Council@dnv.org>; James Gordon <gordonja@dnv.org>
Cc: 'Corrie Kost' [REDACTED]
Subject: Teevan Letter to Council and Clerk about Pigeon Bylaw Agenda Item 8 11 March 8 2021.pdf

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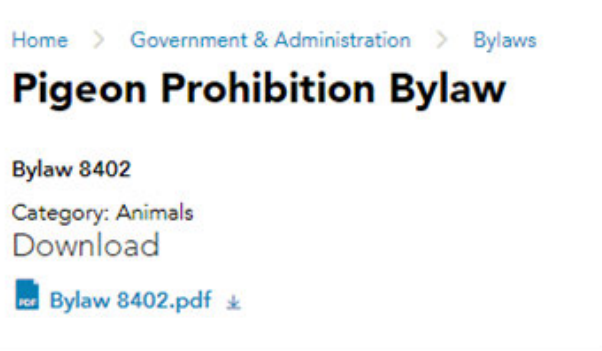
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No Results

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Rules, procedures, etc.

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Please explain this to me.

Peter Teevan

From: [Genevieve Lanz](#)
To: [DNV Input](#)
Subject: FW: Betty Forbes
Date: March 29, 2021 8:19:27 AM

For the record.

From: Dave W [REDACTED]
Sent: March 27, 2021 1:06 PM
To: Mayor and Council - DNV <Council@dnv.org>
Subject: Betty Forbes

Dear Mayor and Council;

It matters little that a legal action with the aim of removing Betty Forbes from office has been dropped. It matters little that Betty Forbes legal council says that "in his view", there was no financial gain to be had by Betty Forbes' tragicomic actions that are nationally known. It matters little that the DNV council has sought to distance itself from the scandal that this is and may still be. The fact remains that this bird brained idea was hatched by Betty Forbes and unfortunately the entire DNV council must wear the guano in perpetuity. Anytime the words pigeon and North Vancouver are uttered in the same breath, there will only be the association of corruption and collusion of petty small minded politicians in the minds of the public. It's sad and probably not completely accurate. I don't think that anyone can truly move on from this until someone does the right thing and resigns permanently from public office.

Dave Wodchis
[REDACTED]

From: [Joshua Cairns](#)
To: [DNV Input](#)
Subject: FW: Form submission from: Proposed Pigeon Regulation Bylaw
Date: April 15, 2021 4:54:57 PM

Forwarded for the record for upcoming Public Meeting on Bylaw 8470 (Monday April 19, 2021).

-----Original Message-----

From: infoweb@dnv.org <infoweb@dnv.org> On Behalf Of District of North Vancouver via District of North Vancouver

Sent: March 08, 2021 5:44 PM

To: Joshua Cairns <CairnsJ@dnv.org>

Subject: Form submission from: Proposed Pigeon Regulation Bylaw

Submitted on Monday, March 8, 2021 - 17:44 Submitted by anonymous user: 50.68.113.83

Submitted values are:

Your name: Abraham Alizadeh

Your email address: [REDACTED]

Do you have comments on this proposed bylaw?

My name is Abraham, I am [REDACTED] and have lived in the District of North Vancouver [REDACTED]

[REDACTED] I have kept pigeons for [REDACTED] Erin Bishop a Property Use Co-ordinator with the DNV, visited my property and observed how I keep pigeons. [REDACTED]

and is approximately [REDACTED] I keep pigeons in excellent conditions, including radiant heated floors and the food I feed them is all human grade.

These birds are my pets and now that [REDACTED] I look forward everyday to spending time with them. I let my birds out occasionally in the summer and they do not land anywhere else but on their loft roof. My neighbours enjoy watching the birds and to date I have not had any issues. I am a responsible neighbour and a responsible pet owner.

In August 28, 2003 a permit to keep pigeons was issued by Brian Bydwell,

File: 3220-20/3. At that time [REDACTED] I

had asked if I moved would I need to apply for a new permit, and was told that I would only need to comply with the bylaws as a permit had been issued.

When I had my house built in [REDACTED] the pigeon coup was part of the building plans and built to the regulations at that time. The coup was built more than 1.5 meters from the side property line, actually it is 64 inches. This complied with the permit regulations that existed at that time.

I would therefore, appreciate being allowed to keep the loft as it is. The next item I would like to address is the number of pigeons, the old bylaw had no limit and the limit of 20 pigeons does not take into account pigeons lost to birds of prey which breed in the summer, on average during the course of the summer I lose over 20 birds.

Thank you for your time and consideration.

The results of this submission may be viewed at:

From: [Joshua Cairns](#)
To: [DNV Input](#)
Subject: FW: Form submission from: Keeping pigeons
Date: April 15, 2021 4:56:57 PM

Forwarded for the record for upcoming Public Meeting on Bylaw 8470 (Monday April 19, 2021).

-----Original Message-----

From: infoweb@dnv.org <infoweb@dnv.org>
Sent: April 08, 2021 12:56 PM
To: Joshua Cairns <CairnsJ@dnv.org>
Subject: Form submission from: Keeping pigeons

Submitted on Thursday, April 8, 2021 - 12:55 Submitted by anonymous user: 207.81.126.209 Submitted values are:

Your name: Kelly Bond

Your email address: [REDACTED] Do you have comments on this proposed bylaw? I am opposed to the keeping of pigeons in city environments. Should this Bylaw be implemented, the Bylaw department MUST be willing, able, confident and consistent in enforcing the proposed regulations at all times and at a single complaint. Much like to solid waste collection Bylaw, there should be no leniency on first time offenders.

The results of this submission may be viewed at:
<https://www.dnv.org/node/2975/submission/91772>

From: [Genevieve Lanz](#)
To: [DNV Input](#)
Cc: [Joshua Cairns](#)
Subject: FW: Draft copy of my presentation at Public Meeting on Bylaw 8470 7pm Monday April 19, 2021
Date: April 15, 2021 4:30:48 PM
Attachments: [Comments on Proposed Bylaw 8470-April 19 2021-full-b.pdf](#)

Forwarded for the record.

-----Original Message-----

From: Corrie Kost <corrie@kost.ca>
Sent: April 15, 2021 3:08 PM
To: Mayor and Council - DNV <Council@dnv.org>; James Gordon <gordonja@dnv.org>
Subject: Draft copy of my presentation at Public Meeting on Bylaw 8470 7pm Monday April 19, 2021

Your Worship & Members of Council,

Attached is the current draft of my full presentation to council for Monday April 19th on the subject of allowing the keeping of pigeons in our residential areas. I realize there is a lot of attached material but I trust you will at least read the first 5 pages which provides my overview of this issue.

By way of CC to the Clerk I am requesting that, if possible, none of the material be redacted.

Yours truly,
Corrie Kost
2851 Colwood Dr.
N. Vancouver, V7R2R3

Comments on Proposed Bylaw 8470, 2021 “Bylaw to Regulate the Keeping of Pigeons”

by Corrie Kost - Version: April 15, 2021

Outline:

1. Disclaimer
2. Issue
3. Position
4. Rationale for my position
5. Federal Government Declaration
6. Process
7. Final comment & Recommendations
8. Reference Material (see the 4 attachments)

1. My opinions on this matter are my own and not those of any organization I may belong to.
2. Is the keeping of pigeons an appropriate use at this time in the DNV? Publicly, one member of council has stated that the member objects to the keeping of pigeons as an “animal rights” issue. Another council member has mentioned that such a use is “unsuitable for an urban environment” although that councillor later expressed concern about the “process” in drafting the prohibition of pigeons bylaw. In my humble opinion, based on safety, the keeping of pigeons in a residential area constitutes an unacceptable health risk to neighbours as well as being a nuisance that threatens the peaceful enjoyment of properties in the neighbourhood. The safety standards that may well have been acceptable in the 1970’s are not longer acceptable today. I firmly believe in the policy of “do no harm” and being a good and considerate neighbour. Hence my position is as stated in 3.
3. I am in **full support** of the **existing Pigeon Prohibition Bylaw 8402** as it was adopted on November 4 2019. **Subject to the definition of “control” as discussed in 6. below, I am opposed to the proposed Pigeon Regulation Bylaw 8470 which would again allow for pigeons in our community.**
4. I oppose bylaw 8470 because of the appearance of the abuse of process (see 6 for details), the insensitivity to the needs/peaceful-enjoyment of residents on neighbouring properties,

and what is abundantly clear is, that for a property the size of a standard residential lot, it is impossible to adequately “control” flying pigeons so that they do not perch/poop on another adjacent parcel. Sections of bylaw 8470, such as 6.(e) “*limited periods*” “*person’s control*” are far too vague to be enforceable. **If however** one interprets “*To be kept within loft at all times except for limited periods necessary for exercise, training or competition when such pigeons must be under the owner's control.*” (extract from page 3 of the staff report – page 139 of council package) where the “limited periods” are times when pigeons are transported to a suitable site **outside** of the DNV, then that would mean the pigeons are NOT able to intrude on neighbouring parcels and thus substantially reduce the negative impacts to the neighbours. **This is the crux of the issue and must be clarified to all before it goes forward to a public meeting.**

5. **The Canadian Federal Government has declared pigeons as pests.** How to deal with them is available at <https://www.canada.ca/en/health-canada/services/pest-control-tips/pigeons.html>

6. The current Pigeon Prohibition Bylaw 8402 was adopted 4:2 (2 opposed, 1 absent for vote) on November 4/2019^(a). Subsequently, in a Report to Council dated Oct 7/2020 and signed by 4 council members (which constitutes a majority) who endorsed ‘*That staff are directed to repeal “Pigeon Prohibition Bylaw 8402, 2019” and replace the bylaw with Bylaw 4078 “Keeping of Pigeons Bylaw”.*^(b,c) That is, the current prohibition bylaw is to be replaced by

the old bylaw. It is plain on the face of it that this is contrary to what is stated on paragraph 2, page 2 (page 138 of 210308RC.AGN.pdf) of the February 18/2021 of the staff report which stated 'Council directed staff to repeal "Pigeon Prohibition Bylaw 8402, 2019" and bring forward for consideration a replacement bylaw that would regulate the keeping of pigeons within the District.' This gives the appearance that staff, not council, is in the driver's seat **on policies** dealing with this issue.

So, not only has a **majority of council, "meeting virtually", without any public notice**, resulted in a council directive to staff to go back to the old 1970 bylaw, but staff appear to have decided to not do this and instead brought forth a new pigeon bylaw 8470.

7. Sometimes it is the little things that matter the most. Banning the keeping of pigeons in the DNV was a good thing. Some have said that such a ban applies to only to one case. Even if this were true (which I doubt) the peace of mind that the ban gave **all of us** was well worth the time of the DNV council. The pigeon banning bylaw is one of the few bylaws that was readily enforceable. It should be noted that every citizen in the DNV (and this includes members of council) have the right to appeal to our council for relief from a clear nuisance.

My recommendations are simple.

If the “crux” of the matter as outline in 4. means any “permitted” pigeons are unable to ever intrude on neighbouring properties (because they are not let lose to fly in the neighbourhood) then I concur with the adopt of Bylaw 8470

else

Defeat proposed bylaw 8470 & leave the existing Pigeon Prohibition Bylaw 8402 intact.

8. Reference Material:

The reference material constitutes the bulk of my presentation. It is not expected that all members of council will fully read them. They are made of both news-clips and scientific journal articles.

(a) Attachment 1

(b) Attachment 2

(c) Attachment 3 - My input to council agenda item 8.10 for Oct 19 2020

(d) Attachment 4 – Additional reference material supporting the banning of pigeons.

ATTACHMENT 1

MOVED by Councillor HANSON

SECONDED by Councillor CURREN

THAT "District of North Vancouver Official Community Plan Bylaw 7900, 2011, Amendment Bylaw 8397, 2019 (Amendment 38)" is given SECOND and THIRD Readings;

AND THAT "District of North Vancouver Rezoning Bylaw 1388 (Bylaw 8398)" is given SECOND and THIRD Readings.

CARRIED

Councillor FORBES declared a potential conflict of interest as she has an interest in the matter and left the meeting at 8:46 p.m.

8.4. Bylaws 8402 and 8403: Pigeon Prohibition

File No. 09.3900.20/000.000

Public Input:

Mr. Vincent Santacroce, 600 Block Rosalyn Boulevard:

- Spoke in opposition of the item;
- Suggested that pigeons are a small matter in municipal business; and,
- Encouraged Council to look further into the matter and the community perception.

MOVED by Councillor MURI

SECONDED by Councillor HANSON

THAT "Pigeon Prohibition Bylaw 8402, 2019" is ADOPTED;

AND THAT "Bylaw Notice Enforcement Bylaw 7458, 2004 Amendment Bylaw 8403, 2019 (Amendment 46)" is ADOPTED.

CARRIED

Opposed: Councillors BACK and BOND

Absent for Vote: Councillor FORBES

Councillor FORBES returned to the meeting at 8:49 p.m.

8.5. Updating Corporate (Municipal) Policies to Align with IPCC Climate Science

File No.

Public Input:

Ms. Claudia Cornwal, 1000 Block Canyon Boulevard:

- Spoke in support of the item;
- Applauded Council for attempts to align themselves with the IPCC report; and,
- Stated that municipalities can bring about change and suggested that carbon negative concrete be used in the construction of future municipal buildings.

ATTACHMENT 2

Dept. Manager	GM/ Director	CAO

The District of North Vancouver REPORT TO COUNCIL

October 7, 2020

File:

AUTHOR: Jordan Back, Mathew Bond, Megan Curren, Jim Hanson

SUBJECT: Repeal Bylaw 8402 and Replace with Bylaw 4078

RECOMMENDATION:

THAT staff are directed to repeal "Pigeon Prohibition Bylaw 8402, 2019" and replace the bylaw with Bylaw 4078 "Keeping of Pigeons Bylaw".

REASON FOR REPORT:

The community and members of Council have expressed concerns over the process of the adoption of "Pigeon Prohibition Bylaw 8402, 2019".

BACKGROUND:

Outline of events are available publicly in the February 2020 report from David Loukidelis QC, in *Review of Adoption of District of North Vancouver Bylaw 8402* as well as through multiple freedom-of-information requests and news reports.

EXISTING POLICY:

The existing policy is "Pigeon Prohibition Bylaw 8402, 2019".

Options:

1. That staff are directed to repeal "Pigeon Prohibition Bylaw 8402, 2019" and replace the bylaw with Bylaw 4078 "Keeping of Pigeons Bylaw".

Respectfully submitted,

Councillor
Jordan Back



Councillor
Mathew Bond



Councillor
Megan Curren



Councillor
Jim Hanson



Attachments:

Attachment 1: Pigeon Prohibition Bylaw 8402, 2019

Attachment 2: Bylaw 4078 "Keeping of Pigeons Bylaw"

REVIEWED WITH:					
<input type="checkbox"/> Community Planning	_____	<input type="checkbox"/> Clerk's Office	_____	External Agencies:	
<input type="checkbox"/> Development Planning	_____	<input type="checkbox"/> Communications	_____	<input type="checkbox"/> Library Board	_____
<input type="checkbox"/> Development Engineering	_____	<input type="checkbox"/> Finance	_____	<input type="checkbox"/> NS Health	_____
<input type="checkbox"/> Utilities	_____	<input type="checkbox"/> Fire Services	_____	<input type="checkbox"/> RCMP	_____
<input type="checkbox"/> Engineering Operations	_____	<input type="checkbox"/> ITS	_____	<input type="checkbox"/> NVRC	_____
<input type="checkbox"/> Parks	_____	<input type="checkbox"/> Solicitor	_____	<input type="checkbox"/> Museum & Arch.	_____
<input type="checkbox"/> Environment	_____	<input type="checkbox"/> GIS	_____	<input type="checkbox"/> Other:	_____
<input type="checkbox"/> Facilities	_____	<input type="checkbox"/> Real Estate	_____		
<input type="checkbox"/> Human Resources	_____	<input type="checkbox"/> Bylaw Services	_____		
<input type="checkbox"/> Review and Compliance	_____	<input type="checkbox"/> Planning	_____		

ATTACHMENT 3

The Corporation of the District of North Vancouver

Bylaw 8402

A bylaw to prohibit pigeons

The Council for The Corporation of the District of North Vancouver enacts as follows:

Citation

1. This bylaw may be cited as “Pigeon Prohibition Bylaw 8402, 2019”.

Prohibition

2. Pursuant to section 8(3)(k) of the *Community Charter*, no person shall own, possess, harbour, or hold or keep in captivity a pigeon or pigeons anywhere in the District.

Exemption

3. Section 2 does not apply to:
 - a. transportation of a pigeon or pigeons through the District;
 - b. administration of veterinarian services to a pigeon; or
 - c. temporary possession of a pigeon by a rescue facility for the purpose of animal rescue,provided that in every case the pigeon or pigeons are securely held or kept in captivity at all times.

Obstruction

4. A person must not interfere with, delay, obstruct or impede a Bylaw Enforcement Officer or designate or other person lawfully authorized to enforce this bylaw in the performance of duties under this bylaw.

Offences and Penalties

5. Every person who violates any of the provisions of this bylaw, or who suffers or permits any act or thing to be done in contravention or in violation of any of the provisions of this bylaw, is deemed to be guilty of an offence against this bylaw and of a separate offence each day the violation is caused or allowed to continue and is liable upon conviction to a fine of up to \$10,000.

Enforcement by Ticket

6. Pursuant to section 264 of the *Community Charter*, this bylaw is designated as a bylaw that may be enforced by means of a ticket in the form prescribed and Bylaw Enforcement Officers are designated to enforce this bylaw.

Ticketing

7. The words or expressions listed below in the “Designated Expression” column are authorized to be used on a ticket issued pursuant to section 264 of the *Community Charter* to designate an offence against the respective section of this bylaw appearing opposite in the “Section” column. The amounts appearing in the “Fine” column below are the fines set pursuant to section 264 of the *Community Charter* for contravention of the respective section of this bylaw appearing opposite in the “Section” column.

Section number	Designated Expression (Short-Form Description)	Fine
2	Own pigeon	\$200
4	Obstruct Bylaw Enforcement Officer	\$200

Repeal

8. Bylaw 4078, Keeping of Pigeons Bylaw is hereby repealed.

Effective Date

9. The effective date of this bylaw is May 1, 2020.

READ a first time October 28th, 2019

READ a second time October 28th, 2019

READ a third time October 28th, 2019

ADOPTED November 4th, 2019

Mayor



Municipal Clerk

Certified a true copy

Municipal Clerk

Comments on Agenda Item 8.10 “Repeal Bylaw 8402 and Replace with Bylaw 4078” or *“Replace the 2019 with the 1971 bylaw”*

Author Corrie Kost

Position: The proposed action would

(a) appear to contravene the intent of the Community Charter, and

(b) threaten the health of some members of the community, and

(c) interfere with the current judicial process.

(a) I have a deep concern over the process now being followed. When 4 or more members of council (thus constituting a quorum) meet or otherwise communicate and place their names both as authors and signatories of a report to council, this constitutes what I believe was a closed “meeting” of council. Since such a “meeting” took place without any public notification it should be declared ultra vires.

I now ask the Clerk to rule as such and declare that this matter be deferred.

(b) ALL our residents have a right to a safe environment. The safety/health standards of 1971 have been enhanced by the Community Charter which gave municipalities the power to regulate this aspect of our lives. Safety matters much more today than it did in 1971.

It is one thing for residents to partake in activities that are unsafe to themselves, but it is unacceptable to do so when those activities can be hazardous to others – especially our most vulnerable citizens.

In support of declaring the keeping of pigeons as a health hazard I refer council to the attached reports B1 to B8.

In the drafting/passage of the new bylaw, one of the four council members argued for its adoption on the basis of animal rights, while another stated that the keeping of pigeons is unsuitable for an urban environment. I ask – what has

changed since the bylaw was adopted? If you feel the process was flawed why not just have a public hearing on the matter?

(c) That this agenda item interferes with the current judicial process should be self evident. Council should not be discussing this matter in a public meeting!

Summary:

a) I suggest that the 4 members of council (a quorum) who drafted the motion in secret did so under a flawed process. An alleged incorrect process cannot be corrected by yet another incorrect process.

b) The keeping of pigeons benefits very few of our residents, but as illustrated in the attached material, is a clear health hazard to the community (where I consider even 1 innocent third party “the community”). Your prime directive should be to protect the community – and that means all of us.

c) This meeting threatens the current judicial process.

Recommendation:

I urge council at least defer such action until the judicial process has been completed.

Finally I plead with the owners of the **two** known pigeon facilities to do the honourable thing by abandoning their lawsuits and removing the pigeons from the DNV. I realise that this may be hard for them to do – but I feel it would be in the best interest of the community.

List of References: All relate to specific health risks due to pigeon droppings.

B1 <http://conditions.health.qld.gov.au/HealthCondition/condition/14/92/76/Histoplasmosis#>

By the government in Queensland Australia (attached)

B2 <https://www.mayoclinic.org/diseases-conditions/histoplasmosis/symptoms-causes/syc-20373495?p=1>

By the Mayo Clinic in the US (attached)

B3 <http://www.idph.state.il.us/public/hb/hbb&bdrp.htm>

By Illinois Department of Public Health (attached)

B4 <https://www.bbc.com/news/health-46964702>

By BBC News (attached)

B5 <https://www.express.co.uk/life-style/health/1076351/Pigeon-infection-Glasgow-hospital-deaths-cryptococcus-infection-symptoms> and <https://www.express.co.uk/news/uk/1074862/NHS-news-pigeon-droppings-two-deaths-Greater-Glasgow-Clyde-probe-Teresa-Inkster> (attached)

News articles from Glasgow Scotland

B6 <https://www.canada.ca/en/health-canada/services/pest-control-tips/pigeons.html> (attached)

By Health Canada

B7 <https://www.omicsonline.org/pdfdownload.php?download=open-access-pdfs/effect-of-pigeon-keeping-on-health-and-family-life-2471-9846-1000190.pdf&aid=92550> (attached)

In Journal of Community & Public Health Nursing

B8 <https://www.cdc.gov/niosh/docs/2005-109/pdfs/2005-109.pdf?id=10.26616/NIOSH PUB2005109> (attached)

By the US CDC

Misc References:

<http://www.ontariotenants.ca/health/Pigeon-droppings-bats-2000.pdf>

Reference B1

Histoplasmosis

Histoplasmosis is caused by a soil-based fungus called *Histoplasma capsulatum*. The *Histoplasma* organism is found in soil with high organic content and undisturbed bird and bat droppings, for example in and around old chicken houses, bat caves and pigeon roosts.

People usually become infected with histoplasmosis after breathing in the microscopic fungal spores from the air.

More than 90% of infected people will have no signs of illness at all; some people may develop a mild illness with signs of lung infection; and it can sometimes spread to other parts of the body (disseminated histoplasmosis) and cause severe life threatening illness.

People who have weakened immune systems (i.e. people who have HIV, or have had an organ transplant) are particularly at risk of complications from histoplasmosis which can lead to death, especially if left untreated.

Histoplasmosis is a rare infection in Australia. Cases have been found in all states of Australia apart from Tasmania, with most reported cases in Queensland and New South Wales. The organism can be found world wide.

Signs and Symptoms:

Very few people who are exposed to *Histoplasma capsulatum* fungus experience any symptoms. In fact it is thought that less than 5% of those infected become unwell.

Symptoms of the infection appear within 3 to 17 days after exposure, most commonly 12-14 days.

The severity of the illness is related to how many spores the person was exposed to, and the ability of their immune system to destroy *Histoplasma* organisms in the body. If a person does become unwell with histoplasmosis, the disease may appear in any of four different forms:

- **Acute respiratory** - the illness varies from a mild respiratory illness to feeling generally very unwell with symptoms of tiredness, high fever, chills, headache, muscle aches, weakness, chest pains, cough and sometimes a rash.
- **Acute disseminated** - the disease quickly becomes severe, with rapid spread of the histoplasma organisms to organs outside the lungs. Symptoms include high fever, cough, exhaustion, gastro symptoms and enlargement of the liver and spleen. This form of histoplasmosis is most frequently seen in infants and young children and in people with weakened immune systems; it is usually fatal if left untreated.
- **Chronic disseminated** - Histoplasmosis develops slowly over a period of 10-11 months as the organism spreads to organs outside of the lungs. People with chronic disseminated histoplasmosis experience mild intermittent fever, weight loss, weakness, anaemia and enlargement of the liver and spleen. Other symptoms will depend on which organs are affected as the organism spreads, and can include signs and symptoms of infection of the liver, lungs, brain or meninges (the covering of the brain) and heart. Ulcers of the mouth, throat, stomach and bowel may be present and problems with the adrenal gland (Addison's Disease) may occur. Chronic disseminated histoplasmosis is nearly always fatal if not treated.
- **Chronic pulmonary** - occurs most often in persons with pre-existing lung diseases such as emphysema. It resembles tuberculosis and is more common in males over 40 years of age. This form of histoplasmosis progresses slowly over months or years and can sometimes resolve without treatment.

Confirmation of histoplasmosis infection usually requires laboratory examinations which identify *Histoplasma capsulatum* in sputum, blood or specimens from biopsies of infected organs, ulcers or lymph nodes.

Treatment:

Most people who develop histoplasmosis do not require treatment. Some may only require treatment that relieves the symptoms of the disease.

Specific antifungal drugs are used to treat severe histoplasmosis. Depending on the severity of the infection and the person's immune status, the course of treatment can last from 3-12 months.

Transmission:

Histoplasmosis is not spread from person to person.

Severe forms of the disease are most frequently seen in infants, young children and people with weakened immune systems.

Outbreaks of histoplasmosis across the world have been associated with construction, maintenance, renovation, excavation, caving, school activities/camps, and agricultural activities.

Prevention:

There is no vaccine available for histoplasmosis.

It can be difficult to prevent exposure to histoplasmosis, especially in areas where the disease is widespread. The following may help reduce the risk of infection:

- Avoid exposure - avoid activities that might expose you to contaminated soil, such as soil with lots of bird and bat droppings, in particular in and around old chicken houses, bat caves and pigeon roosts.
- Dampen potentially contaminated soil. Before you work in or dig soil that possibly contaminated, wet it thoroughly with water. This can help prevent spores from being released into the air. Large amounts of bird or bat droppings should be cleaned up by professional companies that specialize in the removal of hazardous waste.
- Use an effective face mask. One of the best ways to protect yourself from soil-borne organisms is to wear a respirator mask. People working in contaminated areas should use protective clothing such as gloves and coveralls. They should also use a respirator equipped with a high efficiency particulate air (HEPA) filter that is capable of filtering particles down to two microns in size. For major clean-up operations of prolonged exposure, a powered air purifying or supplied air respirator may be necessary.

People who have weakened immune systems (for example, because of HIV/AIDS, an organ transplant, or medications) should be particularly careful to avoid activities which are associated with histoplasmosis, such as caving.

Others who may be at risk include archaeologists, geologists and medical laboratory technicians who test for histoplasmosis.

Health outcome:

Most people recover spontaneously 2-3 weeks after onset of symptoms, although fatigue may persist longer. If histoplasmosis infection spreads to other parts of the body (dissemination), especially to the gastrointestinal tract and central nervous system, a longer and more serious illness can occur (see **Signs and Symptoms**).

Previous histoplasmosis infection provides partial protection if a person becomes reinfected.

Other resources:

[Histoplasmosis information, Centres for Disease Control](http://www.cdc.gov/fungal/diseases/histoplasmosis/) (<http://www.cdc.gov/fungal/diseases/histoplasmosis/>)

Help and assistance:

For further information, please contact your local doctor, health centre or nearest [public health unit](http://www.health.qld.gov.au/system-governance/contact-us/contact/public-health-units/default.asp) (<http://www.health.qld.gov.au/system-governance/contact-us/contact/public-health-units/default.asp>); or call **13 HEALTH (13 43 25 84)** 24 hours a day 7 days a week for the cost of a local call.

References

Allard A, Dearie D, Grenier J et al 2014 Histoplasmosis Outbreak associated with the Renovation of an old house – Quebec Canada 2013. *Morbidity and Mortality Weekly Report* January 3 2014/62 (51) 1041-1044.

Heymann, DL (ed) (2015). *Control of Communicable Diseases Manual*, 20th edition. Washington, DC: American Public Health Association, 284-287.

Jordan A, Chavada R, Nagendra V et al (2013) A budding surprise from the joint – case reports. *Medical Journal of Australia* 199 (10) 18 November.

Mandell J, Dolin R and Blaser M 2015 *Principals and Practice of Infectious Diseases* v 2. Saunders.

McLeod D, Mortimer R, Perry-Keene D, Allworth A et al (2011) Histoplasmosis in Australia Report of 16 cases and Literature Review. *Medicine* 90(1) 61-68.

O'Sullivan MVN, Whitby M, Chahoud C, Miller SM (2004). Histoplasmosis in Australia: A report of a case with a review of the literature. *Australian Dental Journal*, 49 (2), 94-97.

<https://www.mayoclinic.org/diseases-conditions/histoplasmosis/symptoms-causes/syc-20373495?p=1>

REFERENCE B2

Histoplasmosis

Overview

Histoplasmosis is an infection caused by breathing in spores of a fungus often found in bird and bat droppings. The infection is most commonly spread when these spores are inhaled after taking to the air, such as during demolition or cleanup projects.

Soil contaminated by bird or bat droppings also can spread histoplasmosis, putting farmers and landscapers at a higher risk of the disease. In the United States, histoplasmosis commonly occurs in the Mississippi and Ohio River valleys, though it can occur in other areas, too. It also occurs in Africa, Asia, Australia, and in parts of Central and South America.

Most people with histoplasmosis never develop symptoms and aren't aware they're infected. But for some people — primarily infants and those with compromised immune systems — histoplasmosis can be serious. Treatments are available for even the most severe forms of histoplasmosis.

Symptoms

The mildest forms of histoplasmosis cause no signs or symptoms, but severe infections can be life-threatening. When signs and symptoms occur, they usually appear three to 17 days after exposure and can include:

- Fever
- Chills
- Headache
- Muscle aches
- Dry cough
- Chest discomfort
- Fatigue

Some people with histoplasmosis also get joint pain and a rash. People who have a lung disease, such as emphysema, can develop a chronic form of histoplasmosis.

Signs of chronic histoplasmosis can include weight loss and a bloody cough. The symptoms of chronic histoplasmosis sometimes mimic those of tuberculosis.

Severe histoplasmosis

The most severe variety of histoplasmosis occurs primarily in infants and in people with compromised immune systems. Called disseminated histoplasmosis, it can affect nearly any part of your body, including

your mouth, liver, central nervous system, skin and adrenal glands. **If untreated, disseminated histoplasmosis is usually fatal.**

When to see a doctor

Contact your doctor if you develop flu-like symptoms after being exposed to bird or bat droppings — especially if you have a weakened immune system.

Causes

Histoplasmosis is caused by the reproductive cells (spores) of the fungus *Histoplasma capsulatum*. They float into the air when dirt or other material is disturbed.

The fungus thrives in damp soil that's rich in organic material, especially the droppings from birds and bats. It's particularly common in chicken and pigeon coops, old barns, caves, and parks.

Histoplasmosis isn't contagious, so it can't be spread from person to person. If you've had histoplasmosis, you can get it again. However, if you do get it again, the illness will likely be milder the second time.

Risk factors

The chances of developing histoplasmosis symptoms increase with the number of spores you inhale. People more likely to be exposed include:

- Farmers
- Pest control workers
- Poultry keepers
- Construction workers
- Roofers
- Landscapers and gardeners
- Cave explorers
- Demolition workers

Most at risk of severe infection

Children younger than age 2 and adults age 55 and older have weaker immune systems, so they're more likely to develop disseminated histoplasmosis — the most serious form of the disease. Other factors that can weaken your immune system include:

- HIV or AIDS
- Cancer chemotherapy
- Corticosteroid drugs, such as prednisone
- Tumor necrosis factor inhibitors, often used to control rheumatoid arthritis
- Medications that prevent rejection of organ transplants

Complications

Histoplasmosis can cause a number of serious complications, even in otherwise healthy people. For

infants, older adults and people with compromised immune systems, the potential problems are often life-threatening.

Complications can include:

- **Acute respiratory distress syndrome.** Histoplasmosis can damage lungs to the point that the air sacs begin filling with fluid. This prevents good air exchange and can deplete the oxygen in your blood.
- **Heart problems.** Inflammation of the sac that surrounds your heart (pericardium) is called pericarditis. When the fluid in this sac increases, it can interfere with the heart's ability to pump blood.
- **Adrenal insufficiency.** Histoplasmosis can harm your adrenal glands, which produce hormones that give instructions to virtually every organ and tissue in your body.
- **Meningitis.** In some cases, histoplasmosis can cause this inflammation of the membranes surrounding your brain and spinal cord.

Prevention

It's difficult to prevent exposure to the fungus that causes histoplasmosis, especially in areas where the disease is widespread. But taking the following steps might help reduce the risk of infection:

- **Avoid exposure.** Avoid projects and activities that might expose you to the fungus, such as cave exploring and raising birds, such as pigeons or chickens.
- **Spray contaminated surfaces.** Before you dig soil or work in an area that could harbor the fungus that causes histoplasmosis, soak it with water. This can help prevent spores from being released into the air. Spraying chicken coops and barns before cleaning them also can reduce your risk.
- **Wear a respirator mask.** Consult the National Institute for Occupational Safety and Health to determine which type of mask will provide protection for your level of exposure.

By Mayo Clinic Staff

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ILLINOIS DEPARTMENT OF PUBLIC HEALTH

**HEALTH HAZARDS ASSOCIATED WITH BIRD AND BAT DROPPINGS**

Health risks from birds and bats are often exaggerated. Nevertheless, large populations of roosting birds may present the risk of disease to people nearby. The most serious health risks arise from disease organisms that can grow in the nutrient-rich accumulations of bird droppings, feathers and debris under a roost — particularly if roosts have been active for years. External parasites also may become a problem when infested birds or bats leave roosts or nests. The parasites then can invade buildings and bite people.

Histoplasmosis

Histoplasmosis is caused by a fungus (*Histoplasma capsulatum*) found primarily in the areas drained by the Mississippi and Ohio rivers. Both humans and animals can be affected. The disease is transmitted to humans by airborne fungus spores from soil contaminated by pigeon and starling droppings (as well as from the droppings of other birds and bats). The soil under a roost usually has to have been enriched by droppings for two years or more for the disease organism to reach significant levels. Although almost always associated with soil, the fungus has been found in droppings (particularly from bats) alone, such as in an attic.

Infection occurs when spores, carried by the air are inhaled — especially after a roost has been disturbed. Most infections are mild and produce either no symptoms or a minor influenza- like illness. On occasion, the disease can cause high fever, blood abnormalities, pneumonia and even death. In some areas, including portions of Illinois, up to 80 percent of the population show evidence of previous infection. Outbreaks of histoplasmosis have occurred in Central Illinois.

The National Institutes of Health (NIH) has reported a potentially blinding eye condition — presumed ocular histoplasmosis syndrome (OHS) — that probably results from the fungus. NIH estimates that 4 percent of those exposed to the disease are at risk of developing OHS.

Cryptococcosis

Pigeon droppings appear to be the most important source of the disease fungus *Cryptococcus neoformans* in the environment. The fungus is typically found in accumulations of droppings around roosting and nesting sites, for example, attics, cupolas, ledges and water towers. It has been found in as many as 84 percent of samples taken from old roosts. Even when old and dry, bird droppings can be a significant source of infection.

Like histoplasmosis, most cryptococcosis infections are mild and may be without symptoms. Persons with weakened immune systems, however, are more susceptible to infection. The disease is acquired by inhaling the yeast-like cells of the organism.

Two forms of cryptococcosis occur in humans. The generalized form begins with a lung infection and spreads to other areas of the body, particularly the central nervous system, and is usually fatal unless treated. The cutaneous (skin) form is characterized by acne-like skin eruptions or ulcers with nodules just under the skin. The cutaneous form is very rare, however, without generalized (systemic) disease. Outbreaks (multiple cases at a location) of cryptococcosis infections have not been documented.

Other diseases

Other diseases carried or transmitted by birds affect man to a lesser degree. Psittacosis is normally mild in man; however, serious illness can occur rarely. Pigeons and sparrows also have been implicated (along with many other species of birds) as reservoirs for encephalitis viruses such as West Nile encephalitis virus, which are carried by mosquitoes.

Bats and disease

Bats are associated with a few diseases that affect people, such as rabies and histoplasmosis. Rabies is a dangerous, fatal disease, but only about 5 percent of bats submitted for testing are infected with the rabies virus. In recent years, there has been increased concern about the risk of rabies transmission following contact with bats. If an injured or ill bat is found in or around a structure, it should be removed. Because most bats will try to bite when handled, they should be picked up with tongs or a shovel. (contact your local animal control officer or the Illinois Department of Natural Resources at 217- 785-8774 for information on safe bat capture.) If a bat has bitten or scratched a person or pet or is found in your home, capture the bat without touching it with your hands and without crushing its head. If the bat is dead, refrigerate it (DO NOT freeze) and then contact your local health department **immediately** for instructions.

Bats with rabies have been identified in most areas of the state. In recent years, bats have been the most common animal identified with rabies in the state.

The incidence of histoplasmosis being transmitted from bat droppings to humans is not thought to be high. Nevertheless, fresh bat droppings (unlike fresh bird dropping) can contain the histoplasmosis fungus. Bat droppings do not need to come into contact with soil to be a source of the disease.

Ticks, mites and other parasites

Bird or bat roosts can harbor parasites that may invade buildings. Although these parasites can bite and irritate, they are unlikely to transmit diseases to humans. The northern fowl mite and chicken mite are usually the main culprits. Other parasites that may cause problems inside buildings include the pigeon nest bug and the bat bug (both related to the bed bug), soft ticks, biting lice and the pigeon fly. Although most parasites associated with bird or bat roosts die quickly after the birds or bats leave, some may live for several weeks.

Droppings, feathers, food and dead birds under a roosting area can breed flies, carpet beetles and other insects that may become major problems in the immediate area. These pests may fly through open windows or crawl through cracks to enter buildings. If birds or bats are discouraged from roosting around buildings, most of the parasites associated with them will soon die. If the pests are a problem after birds or bats have been excluded, the roost area may be treated with a residual insecticide

appropriately labeled by the U.S. Environmental Protection Agency for control of fleas, ticks, mites and similar pests.

Removal and cleanup of bird and bat droppings

If there is a small accumulation of droppings from a few birds or bats, it can be cleaned up with soap and water. If large quantities of bird or bat droppings are present, contact an environmental engineering consultant for advice.

Workers should follow certain precautions to minimize risk from disease organisms in the droppings:

- During the cleanup, seal heating and cooling air ducts or shut the system down. Only authorized cleanup personnel should be present.
- The cleanup should be done by healthy individuals.
- Wear a respirator that can filter particles as small as 0.3 microns.
- Wear disposable protective gloves, hat, coveralls and shoe coverings.
- Moisten the droppings with a light mist of water to keep spores from becoming airborne and keep them wet.
- Put droppings into sealed plastic garbage bags. The outside of the garbage bags should be rinsed off before they are placed in a disposal container.
- When finished and while still wearing the respirator, remove protective clothing and place it in a plastic bag.
- Wash or shower.
- Check with local government agencies to verify that disposal of the waste is permissible through standard trash pickup.
- Modify the structure to prevent birds or bats from reestablishing the roost.

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health fact sheets



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Pigeon droppings health risk - should you worry?

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An infection linked to pigeon droppings was a "contributing factor" in the death of a child at a Glasgow hospital, it has been confirmed.

The child was being treated at the Queen Elizabeth University Hospital when he or she appears to have caught the infection - a fungus called cryptococcus.

The child has not been named. The fungus did not

contribute to the death in December of a second patient infected with the same pathogen, [say experts](#).

What is it?

Cryptococcus is a yeast-like fungus that lives in the environment.

It can be found in soil contaminated by pigeon droppings.

How can you catch it?

People can become infected if they breathe it in.

The child who died in December at the hospital in Glasgow had been exposed to the fungus.

Experts say the probable source has been traced to a room on the rooftop of the hospital. Pigeon droppings appeared in the room via a small break in the wall which was "invisible to the naked eye", Scottish Health Secretary Jeane Freeman confirmed.

The hospital says it has put infection control measures in place and no further cases have been reported.

How risky is it?

Most won't get sick, but vulnerable people with already weakened immunity can get very ill with a chest infection or meningitis.

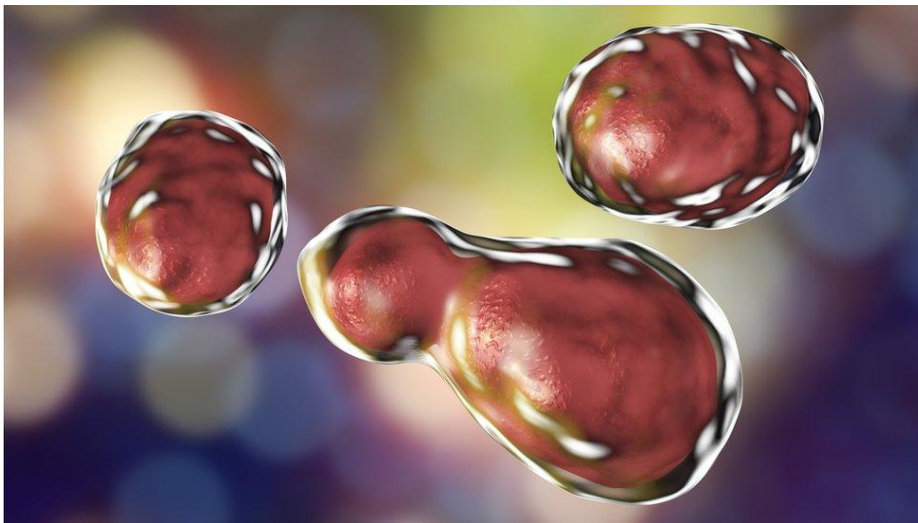


image copyright Getty Images

Expert Prof Hugh Pennington says it is very unusual to see cases in the UK.

"It is common in other parts of the world, particularly tropical parts, in the US and countries like that where they have more problems with this particular kind of fungus. But in the UK, very uncommon.

"There are cases in people who have problems with their immune systems. They're the people who are at risk with this kind of bug."

Cryptococcus infection cannot spread from person to person.

How dangerous is pigeon poo?

Breathing dust or water droplets containing contaminated bird droppings can lead to several diseases, including a flu-like illness called psittacosis.

Salmonella - a bacterial infection that can cause diarrhoea - may also be present in some bird droppings.

If you are cleaning up or come into contact with droppings, you should take precautions. Wash your hands and clean any exposed skin before eating, drinking or putting your hands near your mouth.

Likewise, if you are feeding or handling birds, wash your hands afterwards.

If you have a compromised immune system, including from HIV/AIDS or cancer, you should not clean up droppings.

Pigeon infection: How dangerous is an infection from pigeon droppings? Two dead in Glasgow

PIGEON droppings have been blamed in part for two deaths in a Glasgow hospital, and health officials in Scotland have now called for a safety review. How dangerous is an infection from pigeon droppings?

By [Liam Doyle](#)

PUBLISHED: 10:50, Wed, Jan 23, 2019 | UPDATED: 10:50, Wed, Jan 23, 2019

<https://www.express.co.uk/life-style/health/1076351/Pigeon-infection-Glasgow-hospital-deaths-cryptococcus-infection-symptoms>

NHS Greater Glasgow and Clyde has confirmed two patients died after contracting a fungal infection found in pigeon droppings. The infection is airborne, meaning it was contracted by patients who breathed it in. Currently, some patients are being given medication to prevent possible further infections, and authorities have been quick to assure the public they are not in danger. In a statement, NHS GGC said: "The organism is harmless to the vast majority of people and rarely causes disease in humans."

Related articles



[NHS probe launched after pigeon droppings lead to two Glasgow deaths](#) [See below]

How dangerous is infection from pigeon droppings?

The disease in question is caused by a strain of the *Cryptococcus* fungus, commonly found in both bird and bat droppings.

Commonly referred to as *Cryptococcus neoformans*, the fungus can survive in any environment in the world, but generally prefers darker and moisture rich areas.

According to the Centre for Disease Control, based in the US, *Cryptococcus* is spread by bats, but in the UK it is mostly spread by birds such as pigeons.



Pigeon infection: How dangerous is an infection from pigeon droppings? Two dead in Glasgow hospital
(Image: GETTY)

Cryptococcus neoformans is able to infect humans by releasing microscopic particles of itself, which people then breathe in.

Often, people who breathe in the fungus won't be infected by it.

In the case someone does draw an infection, it is known as cryptococcosis, and usually infects the lungs, brain and spinal cord.

Generally this is rare in people who are otherwise healthy, and those most at risk are those with weakened immune systems.

Those in the hospital would have been particularly at risk, as they would have had other conditions which could have compromised their immune systems.



Cryptococcus initially spreads to the lungs from airborne particles (Image: GETTY)

When the fungus does cause infection, symptoms present themselves in different ways depending on which area of the body is infected.

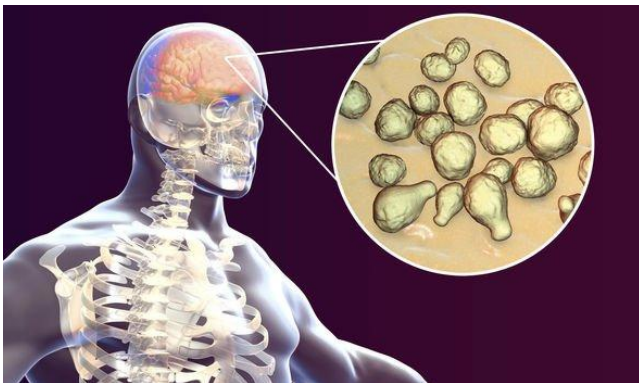
In the lungs, cryptococcosis causes symptoms which are much like pneumonia.

These include:

- Coughing
- Shortness of breath

- Chest pain

- Fever



Cryptococcal meningitis can develop from pigeon poo exposure (Image: GETTY)

When cryptococcosis enters the brain after infecting the lungs, symptoms become more severe.

When Cryptococcus enters the brain, the condition is known as Cryptococcal meningitis, and symptoms include:

- Headache
- Fever
- Neck pain
- Nausea and vomiting
- Sensitivity to light
- Confusion or changes in behaviour

NHS probe launched after pigeon droppings lead to two deaths in Glasgow

PIGEON droppings have led to the deaths of two patients at a hospital in Glasgow triggering an NHS probe, it has been revealed.

By [Carly Read](#) PUBLISHED: 21:17, Sat, Jan 19, 2019 | UPDATED: 21:25, Sat, Jan 19, 2019

<https://www.express.co.uk/news/uk/1074862/NHS-news-pigeon-droppings-two-deaths-Greater-Glasgow-Clyde-probe-Teresa-Inkster>

The patients were admitted to hospital after contracting a fungal infection from the birds' (Image: GETTY)



The patients were admitted to hospital after contracting a fungal infection from the birds' faeces, with NHS Greater Glasgow and Clyde (NHSGCC) now launching an investigation into the death of one patient. The health board said the second patient affected, who was elderly, died of an unrelated matter. Control measures were immediately put in place after the two cases of *Cryptococcus* were detected in both patients, who are yet to be named. Their

families have, however, been made aware of their deaths.

An NHSGCC spokesman said: "Our thoughts are with the families at this distressing time.

"Due to patient confidentiality we cannot share further details of the two cases.

"The organism is harmless to the vast majority of people and rarely causes disease in humans."

The infection is caused by inhaling the fungus *Cryptococcus*, primarily found in soil and pigeon droppings.

NHSGCC said a likely source was found in a non-public area away from wards and the droppings were removed.

The board also said a small number of child and adult patients who are vulnerable to the infection are receiving medication and this has proved effective.

Teresa Inkster, NHSGCC lead consultant for infection control, said: "*Cryptococcus* lives in the environment throughout the world. It rarely causes infection in humans.

"People can become infected with it after breathing in the microscopic fungi, although most people who are exposed to it never get sick from it.

"There have been no further cases since the control measures were put in place.



Cryptococcus symptoms include fever, chest pain, coughing, vision changes and headaches (Image: GETTY)

"In the meantime we are continuing to monitor the air quality and these results are being analysed.

"It remains our priority to ensure a safe environment for patients and staff."

As an extra precaution the health board has installed portable HEPA filter units in specific areas, which filter the air continuously.

NHSGCC said that during the course of investigations, a separate issue arose with the sealant in some of the shower rooms.

Repairs are under way and the maintenance team is working to fix the issue as quickly as possible with minimum disruption, it said.

The health board added that as a further precaution, a specific group of patients are being moved within the hospital due to their clinical diagnosis and ongoing treatment. Cryptococcus symptoms include fever, chest pain, coughing, vision changes and headaches.

<https://www.canada.ca/en/health-canada/services/pest-control-tips/pigeons.html>

Pigeons

What are they?

Pigeons are stout-bodied birds with short necks and short, slender bills with a fleshy cere (the waxy, fleshy covering at the base of the upper beak). The species most commonly referred to just as the "pigeon" is the feral rock pigeon, common in many cities and small rural areas.

The rock pigeon is 32 to 37 cm (12.5 to 14.5 inches) long with a 64 to 72 cm (25 to 28 inch) wingspan. Its lower back is white with two distinctive black bars on its pale grey wings. Its tail has white markings. It is a strong and quick flier, with its lighter grey rump easily seen from above.

The head and neck of the mature pigeon are a darker blue-grey than the back and wings. The green and lilac or purple patch on the side of the neck is larger than that of the stock dove, and the tail is more distinctly banded.

Pigeons come in many different colours depending on age: dark grey, light blue/grey, brown, peach, grey and white, pure white, and more. The feathers of young birds show little lustre and are duller. The eye colour of a pigeon is generally orange, but a few pigeons may have white-grey eyes. The eyelids are orange and are enclosed in a grey-white eye ring. The feet are red to pink.



Did you know?

The pigeon's bobbing head motion helps it to keep its balance when walking. Most studies suggest that pigeons bob their heads to stabilize their visual surroundings. We humans rely more on our eye movements, not our head movements, to catch and hold images while in motion.

Should I be concerned?

Pigeons tend to breed and roost in groups. The biggest problem they cause is the amount of feces (droppings) they produce. The build-up of pigeon feces on buildings and other structures is visually unappealing and is made worse by the fact that pigeon droppings are acidic and erode metal and stonework.

More importantly, pigeon droppings may pose a health hazard to the general public. Pigeons have been associated with a variety of diseases, including histoplasmosis and cryptococcosis.

Histoplasmosis is a disease caused by a fungus that grows in pigeon droppings. The fungus can also be found in bat droppings or in the soil, and is carried by the wind. When removing droppings, people may breathe in some of the fungus. When exposure is high, the fungus can cause infection.

Symptoms of histoplasmosis begin to appear about 10 days after initial infection and can include fatigue, fever, and chest pains. Most infections have no symptoms or appear as a mild respiratory illness. People with weakened immune systems (like cancer patients or people living with HIV/AIDS) are generally more at risk of developing histoplasmosis. The disease cannot be transmitted from person to person.

Cryptococcosis is another fungal disease related to pigeon droppings and grows in soils throughout the world. It is very unlikely that healthy people will become infected even at high levels of exposure. A major risk factor for infection is a compromised immune system.

How can I get rid of pigeons?

Physical control

Controlling pigeons permanently is hard because these birds have adapted to stress, and there are many sources of food available in urban areas. The best way to control them is to change their environment:

- Remove roosting niches and seal any crevices, large openings, and entrances in high areas to discourage pigeons.
- Screen off water sources (like rooftop air conditioners) that pigeons might drink from.
- Never leave food out where pigeons can get it.
- Keep garbage containers closed. Dispose of garbage on a regular basis.
- On flat roofs or ledges, use bristling wires, also known as porcupine wires, or sticky pastes that will discourage pigeons from landing and gathering.

Bird scaring devices

Bird scaring devices can also be bought to frighten birds away from a given area. Loud noises, flashing lights, windmills, and recordings of bird distress calls can be effective ways of controlling pigeons, but may not all be practical in urban settings. Also, pigeons can eventually get used to these types of devices and may ignore them.

If pigeons are a nuisance on a balcony, fine netting can be hung across the front of the balcony, or a combination of visual frightening devices can be used, if they can be moved around to prevent birds from getting used to them.

Products

Important!

If you use a pesticide to control your pest problem, read the label to make sure you are choosing the right product for the right pest. Follow all label directions and warnings carefully. Always look for a Pest Control Products (PCP) number on the label so you know the product has been approved by Health Canada. See [Use pesticides safely](#) for more information on using pesticides safely

- **Bird repellents** are effective in controlling pigeons around the home and garden. These products are soft, sticky substances that you apply on windows, sills, eaves, and roofs to discourage pigeons from roosting. Most bird repellents can be bought at local hardware stores or garden centres.
- Other **bird repellents and bird toxicants** are available for use in, on, or near structures used for roosting or nesting. These products are generally sold for commercial or restricted use by qualified professionals. Bird repellents or toxicants should be combined with changes to make roosting areas less attractive to the birds in a more permanent way.

For more information

- [Use pesticides safely](#)
- [Report a problem with a pesticide](#)

[For industry and professionals](#)

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Effect of Pigeon Keeping on Health and Family Life

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Introduction

Pigeon keeping/breeding is prevalent worldwide and a lot has been written about this hobby/profession and pigeon fanciers in the popular media, websites and books. It is well known that pigeons transmit diseases and cause pulmonary disorders in pigeon keepers/breeders, but, not much is available in the scientific/medical literature regarding the impact of this 'addiction' on the psychological and mental health of the individuals and family life/relations. The following narrative is based mainly on personal experience (NJI), observation (ZHI), websites and common sense.

Pigeon (*Columba livia domestica* - domesticated from wild rock dove) keeping/breeding, practiced for thousands of years in almost every part of the world, has evolved into a hobby or a commercial enterprise for the purpose of aesthetic satisfaction, recreation, entertainment and food [1]. The hobby of breeding or keeping pigeons by pigeon fanciers, for racing (sport), flying, homing and show, is a popular occupation throughout the world. Belgium claims to be the capital of pigeon fanciers, with the world's most valuable racing pigeon: in 2013 Belgian's 'Bolt' sold for \$410,000 [2] and in 2017 it was Belgian's 'Golden Prince' sold for \$465,000 [3,4]. The business of breeding pigeons for food (meat and eggs) has also flourished (Figures 1 and 2).

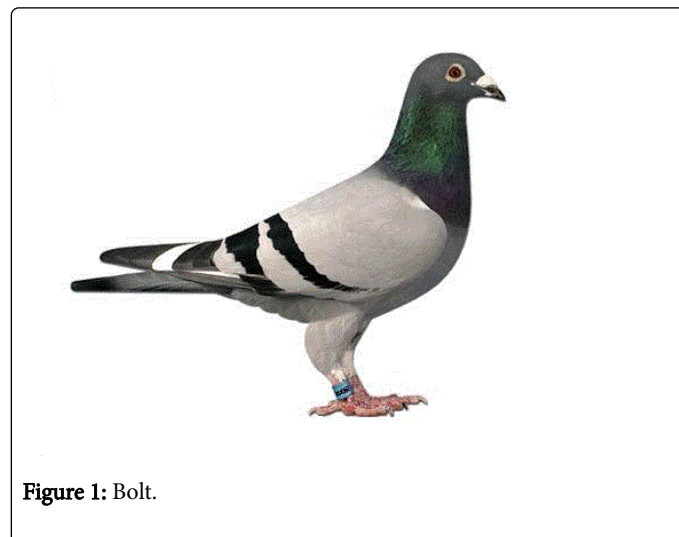


Figure 1: Bolt.

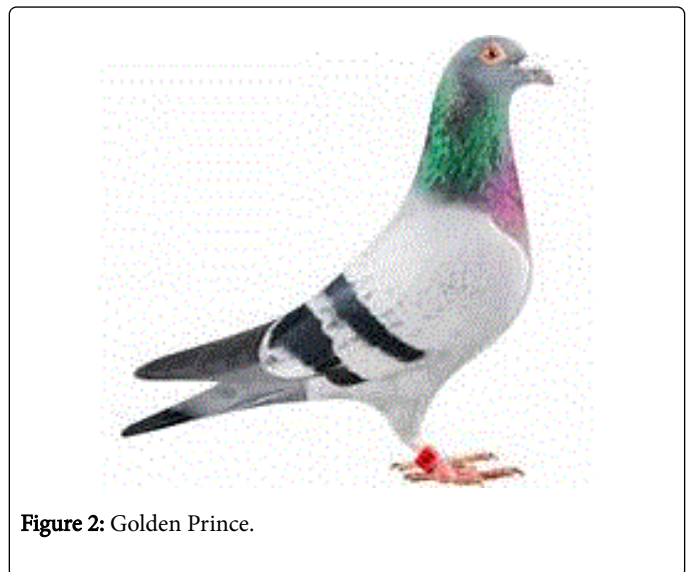


Figure 2: Golden Prince.

Pigeon fanciers have distinguished company [5-7], including the royalty, Mamluk Sultan of Egypt, King Leopold II, British Kings Edward VII, George V and George VI, Queens Victoria and Elizabeth II, King of Belgium, Sultan of Johore, Prince Bernard, German Chancellor Willi Brandt, French President Mitterrand, fashion designer Maurizio Gucci, entrepreneur Walt Disney, inventor Nikola Tesla, artists Pablo Picasso and Claude Monet, scientist/naturalist Charles Darwin and Gerald Durrell, French revolutionary Maximillian Robespierre, boxing champions George Foreman and Mike Tyson, actors Yul Brynner, Roy Rogers, Marlon Brando, Tony Curtis, Michael Landon, Lee Marvin and Clint Eastwood, Rock and Roll singer Elvis Presley, jazz musician Johnny Otis, American football quarterback Terry Bradshaw and baseball player Willie Mays, Irish International footballer Paddy Ambrose, Panamanian dictator Manuel Noriega, etc.

There are at least 800 breeds of domesticated pigeons categorized as (historical) messenger pigeons, homing pigeons, flying/sporting pigeons, racing pigeons, fancy pigeons and utility pigeons [8].

Pigeon fanciers organize exhibitions and bird shows exhibiting thousands of pigeons worldwide (for example in England, Australia, United States, Germany, Belgium, etc.), which are sponsored by hundreds of local, state and national pigeon clubs and attended by thousands of people. Many avid pigeon fanciers usually have a large number of pigeons and they often keep adding more and more to their flock.

Pigeon fanciers love their pigeons. They appreciate their beauty, grace and soothing sounds. They get euphoria, intense pleasure and pleasant excitement from seeing their pigeons perform (racing,

homing, beauty, etc.). They are so passionate about pigeons that they are sometimes called 'pigeon junkies,' and spend an enormous amount of time and money on their hobby.

However, there is a down side to pigeon keeping/breeding in that pigeon fanciers get so involved that their first priority becomes the care and handling of the birds and see them perform, while other aspects of their life, such as their own health, health of family members, as well as the emotional, psychological and financial needs of family (spouses, children and others) are neglected or diminished (NJI - personal experience); even friendships (except with fellow- fanciers) are curtailed. The children and spouses may not get the necessary emotional and quality time, necessary for a healthy family life. There may be domestic disputes and arguments resulting in strained relations. Since most of the pigeon fanciers/keepers are middle income earning males, maintaining a large flock of birds (sometime numbering in hundreds) could also have significant impact on family finances, because a significant portion of the income may go to the birds - acquisition, feeding, housing, healthcare, etc.

Addiction of pigeon fanciers/keepers appears to be behavioral in nature, such as in the case [9] of gambling disorder (pathological gambling), problematic Internet use and gaming, computer dependence, binge eating, compulsive buying, compulsive sexual activities and excessive physical activity (exercise, jogging and running), etc. Behavioral addictions may lead to psychiatric disorders [10]. In the case of pathological gambling, there is a negative impact on the quality of life and financial loss of the gambler [11], impairment of family life (emotional and psychiatric disorders), depression and disruption of social relations [12,13]. Multiple neurotransmitter systems, including dopaminergic, serotonergic, noradrenergic, glutamatergic and opioidergic, have been implicated in some behavioral addictions [14]. In some behavioral addictions, there is an increase in serum levels of endorphins [15] and brain-derived neurotropic factor [16,17].

There is nothing in the literature (Embase, Ovid, PubMed, Scopus, Web of Science), but, from direct observations and personal experience with the pigeon fanciers/keepers indicate that not only the health of the individual but also of the family members is adversely affected, family relations are disrupted, spouses and children are neglected and there is financial strain on the family. It may be difficult to convince pigeon fanciers/keepers (using psychiatric or psychological intervention) to alter their behavior (personal experience). Pigeon fanciers may also get depressed if their prized pigeon(s) do not win in competitions or do not return home. They can talk to fellow fanciers and find comfort.

Pigeons are the source of several diseases that are transmissible to humans (zoonosis), mainly from contact with dried bird droppings, feather dust and mites [18,19]. The main pathology that affects pigeon fanciers/keepers is the pulmonary disease (allergic alveolitis/bronchiolitis/hypersensitivity pneumonitis/pneumothorax/pigeon fanciers' lung/bird breeders' lung [20-23]. Patients may develop pulmonary cysts [22-24], hypersensitivity pneumonitis [25-27], peribronchial fibrosis [28], infiltration of lymphocytes and plasma cells into the walls of the bronchioles and the surrounding alveolar walls [23], bronchiolectosis [28], alveolitis [28], dyspnea and hypoxia [23], pneumothorax [23]. Diagnosis of pulmonary diseases is made by chest X-ray, high-resolution chest computed tomography, pulmonary function tests, natural provocation, bronchoalveolar lavage, transbronchial lung biopsy [29], fluoroenzyme immunoassay [30], as well as presence of IgA and IgG antibodies [28,31] and other immune

biomarkers [32], in the extracts of pigeon droppings and in the serum and bronchoalveolar lavage fluid of patients.

The infections which have been found to be transmitted from pigeons to humans include campylobacters [33], *Chlamydia psittaci*, [34,35], *Cryptococcus neoformans/Candida albicans* [36-39], *Escherichia coli* [40,41], *Histoplasma capsulatum* (from fungus growing on dried feces) [42], *Salmonella enterica/S. typhimurium* [33,42-44] and viral infections (transmitted by mosquitoes feeding on infected birds) [45,46]. Not only are the pigeon keepers/breeders/fanciers at risk to develop the above diseases, but also member of their families who reside with them [24] and are exposed to bird droppings or feather dust.

Bird keepers/fanciers can decrease the risk of developing diseases associated with the birds by using gloves, aprons, masks, respirator while inside the lofts (birds' housing) and by increasing loft ventilation and more often cleaning of the loft..

Avid pigeon fanciers who take part in pigeon racing and flying can damage their eyes from watching their birds in flight for a long time in the bright sun. According to the American Academy of Ophthalmology [47] and American Optometric Association [48], too much exposure to UV light from the sun raises the risks of eye diseases, such as cataract, corneal sunburn and benign growth (pterygium) [49-51]. Furthermore, staying for a long time in the sun, especially in the summer, can result in dehydration, heat-stroke, photo-allergic dermatosis [52], sunburn and solar urticaria [53], facial wrinkling [54], actinic keratosis [55], allergic hypersensitivity skin reactions [55] and cancer of the skin (cutaneous malignant melanoma [56-58], squamous cell carcinoma [55] and basal cell carcinoma [59]), more likely in fair-skinned individuals.

To protect from the damaging effect of long-term exposure to sun, one could use, appropriate sunglasses, ultraviolet radiation-blocking contact lenses (if needed), sunscreen (sunblock), wearing light colored long-sleeved shirts and avoiding exposure to sun at dangerous hours (10.00-16.00). A wide-brimmed hat may be useful, but pigeon fanciers may not like to wear one, because it may scare the birds. Dehydration and heat-stroke may be prevented by ample hydration and taking breaks from staying too long in the sun.

Pigeon fanciers/keepers, who devote a lot of time in taking care of their birds, can develop back and muscle problems from sitting or standing too long, especially in the hot sun or in the cold weather. The risk of back and muscle problems may be decreased by taking short breaks and exercise.

Worldwide, pigeon racing has gained popularity and with it the associated betting and gambling [60] and increased death of the birds while racing (it is estimated that 75% to 90% of birds fail to return after racing); in many cases, underperforming pigeons are culled [61,62]. Although, pigeon racing and betting has been banned in many cities of the United States and other countries, these practices continue [63]. Another crime associated with highly prized competition pigeons is bird-napping and smuggling [64].

It is hoped that this brief article will result in the realization of potential for adverse effects of pigeon keeping/breeding on health and family life, adoption of preventive measures and stimulating a dialog.

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HISTOPLASMOSIS

PROTECTING WORKERS AT RISK

Revised Edition



NCID

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
National Center for Infectious Diseases

NIOSH

Histoplasmosis

Protecting Workers at Risk

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
National Center for Infectious Diseases

December 2004

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Foreword

This booklet is a revised edition of the NIOSH document *Histoplasmosis: Protecting Workers at Risk*, which was originally published in September 1997. The updated information in this booklet will help readers understand what histoplasmosis is and recognize activities that may expose workers to the disease-causing fungus *Histoplasma capsulatum*. The booklet also informs readers about methods they can use to protect themselves and others from exposure.

Outbreaks of histoplasmosis have shared similar circumstances: People who did not know the health risks of breathing in the spores of *H. capsulatum* became ill and sometimes caused others nearby to become ill when they disturbed contaminated soil or accumulations of bird or bat manure. Because they were unaware of the hazard, they did not take protective measures that could have prevented illness.

This booklet will help prevent such exposures by serving as a guide for safety and health professionals, environmental consultants, supervisors, and others responsible for the safety and health of those working near material contaminated with *H. capsulatum*. Activities that pose a health risk to workers at these sites include disturbance of soil at an active or inactive bird roost or poultry house, excavation in regions where this fungus is endemic, and removal of bat or bird manure from buildings.

Local, State, and national public health professionals may also find this booklet useful for understanding the health risks of exposure to *H. capsulatum* so that they can provide guidance about work practices and personal protective equipment. The appendix consists of a fact sheet about histoplasmosis printed in English and Spanish. This fact sheet is intended to help educate workers and the general public about this disease. We urge employers, health agencies, unions, and cooperatives to distribute the fact sheet to all potentially exposed workers.

A handwritten signature in black ink, appearing to read "J. Howard", with a long horizontal flourish extending to the right.

John Howard, M.D.
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Authors and Acknowledgments

This booklet was written by Mr. Steven W. Lenhart, Dr. Millie P. Schafer, and Dr. Mitchell Singal, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention (CDC), and Dr. Rana A. Hajjeh, National Center for Infectious Diseases (NCID), also of CDC. Secretarial support was provided by Ms. Ellen Blythe. Ms. Priscilla Wopat, Spokane Research Laboratory, NIOSH, was the document's editor. Ms. Pauline Elliott of NIOSH, formatted the document. The cover design and respirator drawings were created by Mr. Richard A. Carlson. The histoplasmosis fact sheet was translated to Spanish by Dr. Veronica Herrera-Moreno and Dr. Tania Carreon-Valencia. The authors also extend gratitude to Dr. Donald L. Campbell, Ms. Teresa A. Seitz, Mr. Kenneth F. Martinez, and Ms. Dawn G. Tharr of NIOSH; Dr. Ted Pass II of Morehead State University; and Dr. Myat Htoo Razak for their encouragement and invaluable contributions to this work.

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Histoplasmosis

Protecting Workers at Risk

What is histoplasmosis?

Histoplasmosis is an infectious disease caused by inhaling the spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else.⁽¹⁾

H. capsulatum is a dimorphic fungus, which means it has two forms.^(2,3) It is a mold (mycelial phase) in soil at ambient temperatures, and after being inhaled by humans or animals, it produces a yeast phase when spores undergo genetic, biochemical, and physical alterations.⁽³⁾ Spores of *H. capsulatum* are oval and have two sizes. Macroconidia (large spores) have diameters ranging from 8 to 15 micrometers (µm), and microconidia (small spores) range from 2 to 5 µm in diameter.⁽³⁾ Yeast cells of *H. capsulatum* have oval to round shapes and diameters ranging from 1 to 5 µm.⁽³⁻⁵⁾

Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects), or they experience symptoms so mild they do not seek medical attention and may not even realize that their illness was histoplasmosis.⁽⁶⁾ If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days.⁽¹⁾ Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness.^(1,3,6-8)

A chest X-ray of a person with acute pulmonary histoplasmosis will commonly show a patchy pneumonitis, which eventually calcifies.⁽³⁾

Several years ago, pulmonary calcifications were thought to be associated with healed tuberculosis, when a person had actually had histoplasmosis instead. During the same period, individuals with histoplasmosis were admitted mistakenly to tuberculosis sanatoriums.⁽⁹⁾ Unfortunately, some histoplasmosis patients acquired tuberculosis while residing in open wards with tuberculosis patients.⁽³⁾

Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. Special antifungal medications are needed to arrest the disease.^(1,5,6,10-12) The most severe and rarest form of this disease is disseminated histoplasmosis, which involves spreading of the fungus to other organs outside the lungs. Disseminated histoplasmosis is fatal if untreated,^(1,13) but death can also occur in some patients even when medical treatment is received.⁽¹²⁾ People with weakened immune systems are at the greatest risk for developing severe and disseminated histoplasmosis. Included in this high-risk group are persons with acquired immunodeficiency syndrome (AIDS) or cancer and persons receiving cancer chemotherapy; high-dose, long-term steroid therapy; or other immuno-suppressive drugs.^(6,12,14-18)

A person who has had histoplasmosis can experience reinfection after reexposure to *H. capsulatum*. Persons with immunity to *H. capsulatum* who become reinfected will usually experience a

heightened inflammatory response, but they will have a less severe illness of shorter duration than what resulted from the primary infection.^(3,5)

Not to be confused with reinfection, *reactivation* of latent (inactive) histoplasmosis can occur in elderly and immunocompromised individuals years after infection by *H. capsulatum*.^(2,5) The metabolic activity of dormant yeasts and the methods that enable a microorganism to escape elimination by a host's immune system are unknown.⁽¹⁹⁾

Impaired vision can develop in some people because of a rare condition called “presumed ocular histoplasmosis syndrome.”^(3,5,20–22) The factors causing this condition are poorly understood, and there is no scientific basis establishing *H. capsulatum* as its cause.⁽⁵⁾ Results of laboratory tests suggest that presumed ocular histoplasmosis is associated with hypersensitivity to *H. capsulatum* and not from direct exposure of the eyes to the microorganism. What delayed events convert the condition from asymptomatic to symptomatic are also unknown.⁽²³⁾ This syndrome should not be confused with the involvement of the eye associated on rare occasions with disseminated histoplasmosis.^(3,5) Because the lesions of presumed ocular histoplasmosis syndrome do not progress, treatment is not necessary; however, treatment is essential with active cases of histoplasmosis of the eye.⁽²⁴⁾

How is histoplasmosis diagnosed?

Histoplasmosis can be diagnosed by identifying *H. capsulatum* in clinical samples of a symptomatic person's tissues or secretions, testing the patient's blood serum for antibodies to the microorganism, and testing urine, serum, or other body fluids for *H. capsulatum* antigen.⁽³⁾ On occasion, diagnosis may require a transbronchial biopsy.⁽¹⁴⁾

Culturing of *H. capsulatum*

Culturing clinical specimens is a standard method of microbial identification, but the culturing

process for isolating *H. capsulatum* is costly and time-consuming.⁽²⁵⁾ To complicate matters, positive results are seldom obtained during the acute stage of the illness, except from clinical specimens from patients with disseminated histoplasmosis.^(6,12,14,25–27) However, research advances in polymerase chain reaction technology have resulted in methods that provide rapid, first-line detection and prospective identification of *H. capsulatum* in clinical samples.^(24–30)

Serologic tests

Serologic evidence is often the prime factor in the diagnosis of histoplasmosis.⁽³¹⁾ Rapid and accurate determination of serologic test results depends on the proper collection, storage, and shipment of serum specimens. Thus, following guidelines established for these activities is essential.^(31–33)

Because of their convenience, availability, and utility, the most widely accepted serologic tests are the immunodiffusion test and the complement-fixation test.^(8,25–27) Serologic test results are useful when positive. However, sometimes test results are negative even when a person is sick with histoplasmosis, a situation that arises especially in patients with weakened immune systems.^(6,14,26)

The immunodiffusion test qualitatively measures precipitating antibodies (H and M precipitin lines or bands) to concentrated histoplasmin.^(8,14,34) While this test is more specific for histoplasmosis (i.e., a person who is not infected with *H. capsulatum* is unlikely to have a positive test result) than the complement-fixation test, it is less sensitive (i.e., someone who is acutely infected can have a negative test result).^(8,14,25) Because the H band of the immunodiffusion test is usually present for only 4 to 6 weeks after exposure, it indicates active infection.^(6,8,25) The M band is observed more frequently, appears soon after infection, and may persist up to 3 years after a patient recovers.^(8,14)

The complement-fixation test, which measures antibodies to the intact yeast form and mycelial (histoplasmin) antigen, is more sensitive but less specific

than the immunodiffusion test.⁽¹⁴⁾ Complement-fixing antibodies may appear in 3 to 6 weeks (sometimes as early as 2 weeks⁽³⁴⁾) following infection by *H. capsulatum*, and repeated tests will give positive results for months.^(6,34) The results of complement-fixation tests are of greatest diagnostic usefulness when both acute and convalescent serum specimens can be obtained. A high titer (1:32 or higher) or a fourfold increase is indicative of active histoplasmosis.^(8,26,27,34) Lower titers (1:8 or 1:16), although less specific, may also provide presumptive evidence of infection,^(7,25) but they can also be measured in the serum of healthy persons from regions where histoplasmosis is endemic.⁽²⁷⁾ Antibody titers will gradually decline and eventually disappear months to years after a patient recovers.^(6,8,25,34)

Detection of *H. capsulatum* antigen

A radioimmunoassay method can be used to measure *H. capsulatum* polysaccharide antigen (HPA) levels in samples of a patient's urine, serum, and other body fluids.^(12,25,35,36) The test appears to meet the important need for a rapid and accurate method for early diagnosis of disseminated histoplasmosis, especially in patients with AIDS.^(12,25,36) HPA is detected in body fluid samples of most patients with disseminated infection and in the urine and serum of 25% to 50% of those with less severe infections.⁽²⁵⁾

Histoplasmin skin test

The manufacturing of diluted histoplasmin for skin testing was stopped in January, 2000. The skin testing reagents were still *unavailable* when these guidelines were updated in 2004. A person could learn from a histoplasmin skin test whether he or she had been previously infected by *H. capsulatum*. This test, similar to a tuberculin skin test, had been available at many physicians' offices and medical clinics. A histoplasmin skin test became positive 2 to 4 weeks after a person was infected by *H. capsulatum*, and repeated tests usually gave positive results for the rest of the person's life.⁽²⁶⁾ While histoplasmin skin test information was useful to epidemiologists, a positive skin test did not help

diagnose acute histoplasmosis, unless a previous skin test was known to have been negative.^(6,8,14) A previous infection by *H. capsulatum* can provide partial protection against ill effects if a person is reinfectd.⁽³⁴⁾ Since a positive skin test does not mean that a person is completely protected against ill effects,⁽³⁴⁾ appropriate exposure precautions should be taken regardless of a worker's skin-test status in the past.

Where are *H. capsulatum* spores found?

H. capsulatum grows in soils throughout the world.^(2,14) In the United States, the fungus is endemic and the proportion of people infected by *H. capsulatum* is higher in central and eastern states, especially along the Ohio and Mississippi River valleys.^(3,8,37) The fungus seems to grow best in soils having a high nitrogen content, especially those enriched with bird manure or bat droppings. The organism can be carried on the wings, feet, and beaks of birds and infect soil under roosting sites or manure accumulations inside or outside buildings. Active and inactive roosts of blackbirds (e.g., starlings, grackles, red-winged blackbirds, and cowbirds) have been found heavily contaminated by *H. capsulatum*.^(34,38,50) Therefore, the soil in a stand of trees where blackbirds have roosted for 3 or more years should be suspected of being contaminated by the fungus.^(42,51) Habitats of pigeons^(38–40,52–54) and bats,^(38,55–72) and poultry houses with dirt floors^(38,73–78) have also been found contaminated by *H. capsulatum*.

On the other hand, fresh bird droppings on surfaces such as sidewalks and windowsills have not been shown to present a health risk for histoplasmosis because birds themselves do not appear to be infected by *H. capsulatum*.^(34,79) Rather, bird manure is primarily a nutrient source for the growth of *H. capsulatum* already present in soil.⁽²⁷⁾ Unlike birds, bats can become infected with *H. capsulatum* and consequently can excrete the organism in their droppings.^(27,62,65,80)

Increasing numbers of resident Canada geese in urban and suburban areas have caused concern about whether droppings and water contaminated by their droppings are possible sources of disease transmission to humans. As with exposures to the fresh droppings of other birds, exposures to goose droppings have not been shown to be a health risk for histoplasmosis. However, the human pathogens *Cryptosporidium*, *Giardia*, and *Campylobacter* have been found in Canada goose droppings.^(81–83) The fecal-oral route is the primary route of ingesting pathogens that could cause infection and disease, notably diarrhea and gastroenteritis.⁽⁸²⁾ Thus, people working in areas frequented by Canada geese, such as ground maintenance workers at golf courses and parks, should take precautions to prevent hand-to-mouth contact with droppings.⁽⁸¹⁾

To learn whether soil or droppings are contaminated with *H. capsulatum* spores, samples must be collected and cultured. The culturing process involves inoculating mice with small portions of a sample, sacrificing the mice after 4 weeks, and streaking agar plates with portions of each mouse's liver and spleen.⁽³⁸⁾ Then for four more weeks, the plates are watched for the growth of *H. capsulatum*. Enough samples must be collected so that small but highly contaminated areas are not overlooked. On several occasions, *H. capsulatum* has not been recovered from any of the samples collected from material believed responsible for causing illness in people diagnosed from the results of clinical tests as having histoplasmosis.^(39,40,61,74,84–86) Molecular techniques, such as polymerase chain reaction methods that produce results in days instead of weeks, may provide less costly and quicker methods of analyzing soil samples for *H. capsulatum*.⁽⁸⁷⁾

Until a less expensive and more rapid method is available, testing field samples for *H. capsulatum* will be impractical in most situations. Consequently, when thorough testing is not done, the safest approach is to assume that the soil in regions where *H. capsulatum* is endemic and any accumulations of bat droppings or bird manure are contaminated with

H. capsulatum and to take appropriate exposure precautions.

Who can get histoplasmosis and what jobs and activities put people at risk for exposure to *H. capsulatum* spores?

Anyone working at a job or present near activities where material contaminated with *H. capsulatum* becomes airborne can develop histoplasmosis if enough spores are inhaled. After an exposure, how ill a person becomes varies greatly and most likely depends on the number of spores inhaled and a person's age and susceptibility to the disease. The number of inhaled spores needed to cause disease is unknown. Generally, very few people will develop symptomatic disease after a low-level exposure to material contaminated with *H. capsulatum* spores. However, longer durations of exposure and exposure to higher concentrations of airborne contaminated material increase a person's risk of developing histoplasmosis.⁽⁵⁾ Children younger than 2 years of age, persons with compromised immune systems, and older persons, in particular those with underlying illnesses such as diabetes and chronic lung disease, are at increased risk for developing symptomatic histoplasmosis.^(3,4,14,88)

The U.S. Public Health Service (USPHS) and the Infectious Diseases Society of America (IDSA) have jointly published guidelines for the prevention of opportunistic infections in persons infected with the human immunodeficiency virus (HIV).⁽⁸⁹⁾ The USPHS/IDSA Prevention of Opportunistic Infections Working Group recommended that HIV-infected persons "should avoid activities known to be associated with increased risk (e.g., creating dust when working with surface soil; cleaning chicken coops that are heavily contaminated with droppings; disturbing soil beneath bird-roosting sites; cleaning, remodeling, or demolishing old buildings; and exploring caves)."⁽⁸⁹⁾ HIV-infected persons should consult their health care provider about appropriate exposure precautions that should be

taken for any activity with a risk of exposure to *H. capsulatum*.

Below is a partial list of occupations and hobbies with risks for exposure to *H. capsulatum* spores. Appropriate exposure precautions should be taken by these people and others whenever contaminated soil, bat droppings, or bird manure is disturbed.

- ◆ Bridge inspector or painter^(55,63,72,86)
- ◆ Chimney cleaner⁽⁶⁶⁾
- ◆ Construction worker^(12,57,58,67,85,90)
- ◆ Demolition worker^(7,57,73)
- ◆ Farmer^(7,12,74–77,86)
- ◆ Gardener^(7,78,91)
- ◆ Heating and air-conditioning system installer or service person^(8,61)
- ◆ Microbiology laboratory worker^(23,53,64,86)
- ◆ Pest control worker
- ◆ Restorer of historic or abandoned buildings^(61,64)
- ◆ Roofer⁽⁵²⁾
- ◆ Spelunker (cave explorer)^(56,59,60,68–71)

If someone who engages in these activities develops flu-like symptoms days or even weeks after disturbing material that might be contaminated with *H. capsulatum*, and the illness worsens rather than subsides after a few days, medical care should be sought and the health care provider informed about the exposure.

Outbreaks of histoplasmosis have occurred among people who were infected by *H. capsulatum* even though they had no part in the activities that caused contaminated material to become aerosolized.^(39,52,92,93)

After a small group of students raked and swept a 20-year accumulation of dirt, leaves, and debris in a middle school's courtyard on Earth Day–1970,

nearly 400 people (mostly students) developed histoplasmosis.⁽⁹²⁾ The school's forced-air ventilation system, which had fresh air intakes in the courtyard, was implicated as being primarily responsible for spreading contaminated air throughout the school. Results of the outbreak investigation showed that a few students developed histoplasmosis despite being absent from school on the day when the courtyard was cleaned. This finding suggests that exposures to spore-contaminated dust continued for a day or more after cleaning of the courtyard was stopped.

During a histoplasmosis outbreak in 2001, 523 people (439 of them were students) met a laboratory-confirmed case definition of histoplasmosis following the rototilling of a 10-foot by 45-foot area of soil within a high school's courtyard.⁽⁹³⁾ Spore-contaminated air entered a wing of the school most likely through open windows that faced the courtyard and heating, ventilating, and air-conditioning systems that had fresh air intakes in the courtyard. As with the 1970 Earth Day outbreak, this study's findings also showed that a few persons were infected despite being absent from school on the day of the rototilling activity and the following day.

Should workers who might be exposed to *H. capsulatum* have pre-exposure skin or blood tests?

If a histoplasmin test was available again, workers at risk of exposure to *H. capsulatum* might learn useful information from skin testing. The results of skin testing would inform each worker of his or her status regarding either susceptibility to infection by *H. capsulatum* (a negative skin test) or partial protection against ill effects if reinfected (a positive skin test). However, a false-negative skin test result can be reported early in an infection or with persons with weakened immune systems.^(6,8,14,26,34) A false-positive skin test can result from cross-reactions with antigens of certain other pathogenic fungi.^(8,37) One drawback to routine pre-exposure skin testing is that a person with a positive skin test

might incorrectly assume a false sense of security that he or she is completely protected against ill effects if reinfected. The work practices and personal protective equipment described in this booklet are expected to protect both skin-test positive and skin-test negative persons from excessive inhalation exposures to materials that might be contaminated with *H. capsulatum*.

Although a pre-exposure serum sample could be useful in determining whether a worker's post-exposure illness is histoplasmosis, routine collection and storage of serum specimens from workers is unnecessary and impractical in most work settings. Some employers, such as public health agencies and microbiology laboratories, have facilities for long-term storage of serum and do collect pre-exposure serum specimens from those employees who might be exposed to high-risk infectious agents. If a worker is to have blood drawn for this purpose and is to receive a histoplasmin skin test, the blood sample should be drawn first because the skin test may cause a positive complement-fixation test for up to 3 months and the appearance of the M band on an immunodiffusion test for *H. capsulatum*.^(1,7,8,26)

What can be done to reduce exposures to *H. capsulatum*?

Excluding a colony of bats or a flock of birds from a building

Although a primary focus of this booklet is how to protect the health of workers cleaning up accumulated bat or bird manure, the best work practice is to prevent the accumulation of manure in the first place. Therefore, when a colony of bats or a flock of birds is discovered roosting in a building, immediate action should be taken to exclude the intruders by sealing all entry points. Any measure that might unnecessarily harm or kill a bat or bird should be avoided.

Before excluding a colony of bats or a flock of birds from a building, attention should be given to the possibility that flightless young may be present. In

the United States, this is an especially important consideration for bats from May through August.⁽⁹⁴⁾

Ultrasonic devices and chemical repellents are ineffective for eliminating bats from a roosting area.⁽⁹⁵⁾ The most effective way of excluding bats from an occupied roost involves following five basic steps to identify and seal entry and exit points.⁽⁹⁴⁾ Because some bat species are so small that they can squeeze through an opening as small as the diameter of a dime,⁽⁹⁴⁾ even the smallest hole should be sealed. When openings are inaccessible, installing and maintaining lights in a roosting area will force bats to seek another daytime roosting site. Because of concerns for the welfare of evicted bats, constructing bat houses near former roosts has become a common practice.^(94,96)

In some buildings, extensive bat exclusion measures may be more successful in the late fall or winter months after a colony has migrated to a warmer habitat or to another location for hibernation. In some regions of the United States, bats may not migrate, but rather will hibernate in the same building. Consequently, any work on a building that might disturb such a colony should be delayed until spring. Disturbing bats during hibernation is likely to result in their death.

Excluding birds from a building also involves blocking access to indoor roosts and nesting areas.⁽⁹⁷⁾ Because their food source is usually nearby, birds prevented from reentering a building will often complicate an exclusion by beginning to roost on window sills and ledges of the building or others nearby. Visual deterrents (e.g., balloons, flags, lights, and replicas of hawks and owls) and noises (e.g., gun shots, alarms, gas cannons, and fireworks) may scare birds away, but generally only temporarily.⁽⁹⁷⁾

Nontoxic, chemical bird repellents are available as liquids, aerosols, and nondrying films and pastes. Disadvantages of these antiroosting materials are that some are messy and none are permanent. Even

the most effective ones require periodic reapplication. More permanent repellents include mechanical antiroosting systems consisting of angled and porcupine wires made of stainless steel. These systems may require some occasional maintenance to clear nesting material or other debris from the wires.⁽⁹⁷⁾

Pigeons can be controlled by capturing them in traps placed near their roosting, loafing, or feeding sites.⁽⁹⁷⁾ Shooting birds, using contact poisons, and baiting with poisoned food should be used as last resorts and should only be done by qualified pest control specialists. Using such methods to kill nuisance birds may also require a special permit.

Posting health risk warnings

If a colony of bats or a flock of birds is allowed to live in a building or a stand of trees, their manure will accumulate and create a health risk for anyone who enters the roosting area and disturbs the material. Once a roosting site has been discovered in a building, exclusion plans should be made, and the extent of contamination should be determined. When an accumulation of bat or bird manure is discovered in a building, removing the material is not always the next step. Simply leaving the material alone if it is in a location where no human activity is likely may be the best course of “action.”

Areas known or suspected of being contaminated by *H. capsulatum*, such as bird roosts, attics, or even entire buildings that contain accumulations of bat or bird manure, should be posted with signs warning of the health risk. Each sign should provide the name and telephone number of a person to be contacted if there are questions about the area. In some situations, a fence may need to be built around a property or locks put on attic doors to prevent unsuspecting or unprotected individuals from entering.

Communicating health risks to workers

Before an activity is started that may disturb any material that might be contaminated by *H. capsulatum*,

workers should be informed in writing of the personal risk factors that increase an individual's chances of developing histoplasmosis. Such a written communication should include a warning that individuals with weakened immune systems are at the greatest risk of developing severe and disseminated histoplasmosis if they become infected. These people should seek advice from their health care provider about whether they should avoid exposure to materials that might be contaminated with *H. capsulatum*. The fact sheet in the appendix is one way of conveying information about histoplasmosis; it can be distributed to workers during their hazard communication training.

Controlling aerosolized dust when removing bat or bird manure from a building

The best way to prevent exposure to *H. capsulatum* spores is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. A brief inhalation exposure to highly contaminated dust may be all that is needed to cause infection and subsequent development of histoplasmosis. Therefore, work practices and dust control measures that eliminate or reduce dust generation during the removal of bat or bird manure from a building will also reduce risks of infection and subsequent development of disease. For example, instead of shoveling or sweeping dry, dusty material,⁽³⁹⁾ carefully wetting it with a water spray can reduce the amount of dust aerosolized during an activity. Adding a surfactant or wetting agent to the water might reduce further the amount of aerosolized dust. Once the material is wetted, it can be collected in double, heavy-duty plastic bags, a 55-gallon drum, or some other secure container for immediate disposal. An alternative method is use of an industrial vacuum cleaner with a high-efficiency filter to “bag” contaminated material. Truck-mounted or trailer-mounted vacuum systems are recommended for buildings with large accumulations of bat or bird manure. These high-volume systems can remove tons of contaminated material in a short period. Using long, large-diameter hoses, such a system can also

remove contaminated material located several stories above its waste hopper. This advantage eliminates the risk of dust exposure that can happen when bags tear accidentally or containers break during their transfer to the ground.

The removal of all material that might be contaminated by *H. capsulatum* from a building and immediate waste disposal will eliminate any further risk that someone might be exposed to aerosolized spores. Air sampling, surface sampling, or the use of any other method intended to confirm that no infectious agents remain following removal of bat or bird manure is unnecessary in most cases. However, before a removal activity is considered finished, the cleaned area should be inspected visually to ensure that no residual dust or debris remains.

Disinfecting contaminated material

Disinfectants have occasionally been used to treat contaminated soil and accumulations of bat manure when removal was impractical or as a precaution before a removal process was started.^(41,48–50,61,67) To date, formaldehyde solutions have been the only disinfectants proven to be effective for decontaminating soil containing *H. capsulatum*.^(41,48–50) Exposures to formaldehyde through ingestion, inhalation, and skin and eye contact can cause a variety of adverse health effects.⁽⁹⁸⁾ Several years ago, applicators exposed to formaldehyde during soil disinfection activities reported burning eyes and mucous membrane irritation.⁽⁴⁸⁾ Workers at another site experienced nausea and vomiting.⁽⁴¹⁾

Today, although a number of EPA-registered fungicidal products contain formaldehyde, none of them is registered for use as a soil disinfectant. Thus, using a formaldehyde containing product to disinfect soil would be inappropriate. Furthermore, there is no product or chemical that is registered by the EPA that has the specific claim of being effective against *H. capsulatum*. A manufacturer of a product claiming to disinfect soil contaminated with *H. capsulatum* will have to meet the EPA's regula-

tory requirements and complete the registration process.

Should an EPA-registered product become available to disinfect land contaminated by *H. capsulatum*, measures should be taken to ensure that the disinfectant penetrates deeply enough to contact all the soil containing *H. capsulatum*. While *H. capsulatum* was found in a blackbird roost at a depth of more than 12 inches,⁽⁹⁹⁾ soil saturation to a depth of 6 to 8 inches will be sufficient for most disinfectant applications.^(38,48) To evaluate a disinfectant's effectiveness, soil samples should be collected before and after an application and analyzed for *H. capsulatum*. The appropriate number of samples to be collected will vary depending upon the size of the property.^(38,100) Each sampling location should be flagged or marked in a way that will ensure that the same locations will be sampled after application of the disinfectant. A map of the treated area showing the approximate location of each sampling site will also be useful in the event flags or markings are lost. After a disinfectant's effectiveness has been documented—more than one application may be necessary—additional tests for *H. capsulatum* should be done periodically if the land remains idle.

Disposing of waste

Any material that might be contaminated with *H. capsulatum* that is removed from a work site should be disposed of or decontaminated properly and safely and not merely moved to another area where it could still be a health hazard. Before an activity is started, the quantity of material to be removed should be estimated. (If the approximate volume of dry bat or bird manure in a building is known, the approximate weight can be calculated using a conversion factor of 40 pounds per cubic foot.) Requirements established by local and state authorities for the removal, transportation, and disposal of contaminated material should be followed. Arrangements should be made with a landfill operator concerning the quantity of material to be disposed of, the dates when the material will be delivered, and the disposal location. If local or state land-

fill regulations define material contaminated with *H. capsulatum* to be infectious waste, incineration or another decontamination method may also be required.

Controlling aerosolized dust during construction, excavation, and demolition

Dusts containing *H. capsulatum* spores can be aerosolized during construction, excavation, or demolition. Once airborne, spores can be carried easily by wind currents over long distances. Such contaminated airborne dusts can cause infections not only in persons at a work site, but also in others nearby. Such activities were suggested as the causes of the three largest outbreaks of histoplasmosis ever recorded. All three outbreaks took place in Indianapolis, Indiana.^(25,85,88,101) During the first outbreak, in the fall of 1978 and spring of 1979, an estimated 120,000 people were infected, and 15 people died. The second outbreak, in 1980, was similar to the first in the number of people affected. AIDS patients accounted for nearly 50% of culture-proven cases during the third outbreak, which began in 1988 and lasted until 1993.⁽¹⁰¹⁾

Water sprays or other dust suppression techniques should be used to reduce the amount of dust aerosolized during construction, excavation, or demolition in regions where *H. capsulatum* is endemic. During windy periods or other times when typical dust suppression techniques are ineffective, earthmoving activities should be interrupted. All earthmoving equipment (e.g., bulldozers, trucks, and front-end loaders) should have cabs with air-conditioning (if available) to protect their operators. Air filters on air-conditioners should be inspected on a regular schedule and cleaned or replaced as needed. During filter cleaning or replacement of exceptionally dusty air filters, respiratory protection should be worn by the maintenance person if there is a potential for the dust to be aerosolized. Beds of all trucks carrying dirt or debris from a work site should be covered, and all trucks should pass through a wash station before leaving the site. When at a dump site, a truck operator should ensure that all individuals in the vicinity are in an area

where they will not be exposed to dust aerosolized while the truck is emptied.

Water sprays and other suppression techniques may not be enough to control dust aerosolized during demolition of a building or other structure. Consequently, removal of accumulations of bird or bat manure before demolition may be necessary in some situations. Factors affecting decisions about pre-demolition removal of such accumulations include the quantity and locations of the material, the structural integrity or soundness of the building, weather conditions, proximity of the building to other buildings and structures, and whether nearby buildings are occupied by persons who may be at increased risk for developing symptomatic histoplasmosis (e.g., schools, day-care facilities, hospitals, clinics, jails, and prisons).

City or county governments in regions where *H. capsulatum* is endemic should establish and enforce regulations concerning work practices that will control dust aerosolization at construction, excavation, and demolition sites. However, even in regions where *H. capsulatum* is not considered endemic, dust aerosolized during work activities in bird roosts has also resulted in outbreaks of histoplasmosis.^(40,45) Consequently, regardless of whether a work site is in an endemic region, precautions should be taken at active and inactive bird roosts to prevent dust aerosolization.

Wearing personal protective equipment

Because work practices and dust control measures to reduce worker exposures to *H. capsulatum* have not been fully evaluated, using personal protective equipment is still necessary during some activities. During removal of an accumulation of bat or bird manure from an enclosed area such as an attic, dust control measures should be used, but wearing a NIOSH-approved respirator and other items of personal protective equipment is also recommended to reduce further the risk of *H. capsulatum* exposure.

For some jobs involving exposures to airborne dusts, working conditions have changed little over the

years despite improvements in other aspects of the industry. For example, inhalation of dust aerosolized from the dirt floors of chicken coops that contained *H. capsulatum* spores was reported more than 40 years ago as the cause of clinical cases of histoplasmosis in workers.^(73–77) As the poultry industry has grown, the old-style chicken coop has been replaced by larger housing facilities. In the United States in 2002, approximately 82,400 farms produced eggs or poultry including layers, pullets, broilers, turkeys, ducks, and geese.⁽¹⁰²⁾ However, the floors of most poultry houses are still dirt covered and provide an excellent medium for the growth of *H. capsulatum*. Ventilation systems in poultry houses are not primarily intended to reduce poultry workers' exposures to aerosolized dust, and dust measurements made during growing and catching chickens show that inhalation exposures of poultry workers to dust can be excessive.⁽¹⁰³⁾ Since ventilation systems designed especially to reduce airborne dust to "safe" levels in poultry houses would likely be economically and mechanically impractical, wearing a respirator is probably the most feasible method for protecting poultry workers.

Recommendations for selecting respirators to protect workers against inhalation exposures to airborne dust and *H. capsulatum* are described next. Following that, recommendations for personal protective equipment other than respirators are provided.

What are the advantages and disadvantages of various kinds of respirators for protecting workers against exposure to *H. capsulatum*?

Assigned protection factors

Respirators provide varying levels of protection, and people have developed histoplasmosis after disturbing material contaminated with *H. capsulatum* despite wearing either a respirator or a mask that they assumed would protect them.^(60,71,104) Such unfortunate events demonstrate that when a respirator is needed, it must be carefully selected with an understanding of the circumstances associated with

exposure to an airborne contaminant and the capabilities and limitations of the various kinds of respirators.

Because respirators provide different levels of protection, they are divided into classes, and each respirator class has been assigned a protection factor to help compare its protective capabilities with other respirator classes. An assigned protection factor is a unitless number determined statistically from a set of experimental or workplace data. This factor is the minimum level of protection expected for a substantial proportion (usually 95%) of properly fitted and trained respirator users.⁽¹⁰⁵⁾

When the effectiveness of a respirator is evaluated in a workplace, a protection factor is calculated for each respirator wearer and respirator combination by dividing the air concentration of a challenge agent by the air concentration of that agent inside the respirator wearer's facepiece, hood, or helmet. For example, if air sampling measurements show equal concentrations of a contaminant inside and outside a respirator wearer's facepiece, then the respirator provided no protection, and a protection factor of 1 would be calculated. Likewise, a protection factor of 5 means that a respirator wearer was exposed to one-fifth (20%) of the air concentration to which he or she would have been exposed if a respirator had not been used, a reduction of 80%. Similarly, a protection factor of 10 represents a one-tenth (10%) exposure (a 90% reduction), 50 represents a one-fiftieth (2%) exposure (a 98% reduction), and so on.

The assigned protection factors of respirators available for protecting workers against exposures to airborne materials contaminated with *H. capsulatum* range from 10 to 10,000.^(106,107,108) Disposable respirators and elastomeric half-facepiece respirators represent the low end of the protection-factor scale. Self-contained breathing apparatuses operated in the pressure-demand mode, represent the high end. Within this range is a variety of negative-pressure, powered air-purifying, and supplied-air respirators

that are available with half-facepiece, full facepiece, loose-fitting facepiece, hood, or helmet. Later in this section, the advantages and disadvantages of these various respirators are described.

Respirator selection

Before the specific types of respirators are described, it is important to understand the information that is usually needed to select a respirator for a particular activity.

The hazard ratio method, or the industrial hygiene method, is a quantitative method used most commonly to select respirators for noninfectious aerosols, gases, and vapors. Using this method requires estimates of the air concentrations of a contaminant measured during a person's work activities and knowledge of the established (or recommended) occupational exposure limits of that contaminant. A minimum level of respiratory protection is calculated by dividing the highest air concentration measurement by the most protective occupational exposure limit of the contaminant. A respirator from the respirator class having an assigned protection factor equal to or exceeding this value would then be selected. For example, assume a set of air samples collected during a particular job resulted in exposure estimates ranging from 8 to 50 milligrams per cubic meter (mg/m^3) of sampled air for a contaminant having occupational exposure limits of $5 \text{ mg}/\text{m}^3$ and $10 \text{ mg}/\text{m}^3$. Given this information, a respirator with an assigned protection factor of at least 10 ($50 \text{ mg}/\text{m}^3 \div 5 \text{ mg}/\text{m}^3 = 10$) should be selected. However, applying the hazard ratio method to respirator selection decisions for infectious aerosols is difficult and often impossible.⁽¹⁰⁹⁾

Unfortunately, published air sampling data on *H. capsulatum* spores are either outdated or too limited,^(68–70,76,80,110,111) and no numerical exposure limit exists for *H. capsulatum*. In situations such as this, when the important data needed for the hazard ratio method are either uncertain or unavailable, the expert opinion method is usually used.⁽¹⁰⁹⁾ This method is a qualitative approach to making decisions

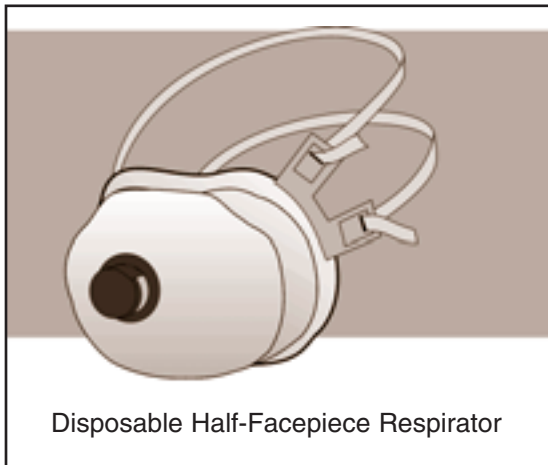
about respirators based on the subjective professional judgment of one or more experts. Respirator selection is made after considering the characteristics of job activities that are recognized or anticipated to involve risks of exposure to airborne contaminants; consideration of the properties of the specific agent involved and health effects of overexposure; and knowledge of the assigned protection factors, advantages, and disadvantages of various respirators.⁽¹⁰⁹⁾ In this application of the expert opinion method, categorical risk estimates were developed with the levels of recommended respiratory protection increasing as the perceived levels of exposure increased.⁽¹⁰⁹⁾

The following respirator selection information describes classes of respirators in order of increasing assigned protection factors. The assigned protection factors used here are from Table 1 of the *NIOSH Respirator Selection Logic*.⁽¹⁰⁶⁾ Respirators that should be worn during work activities involving exposures to spore-contaminated airborne dusts range from disposable, filtering facepiece respirators for low-risk situations (e.g., site surveys of bird roosts) to full-facepiece, powered air-purifying respirators for extremely dusty work (e.g., removing accumulated bird or bat manure from an enclosed area such as an attic).

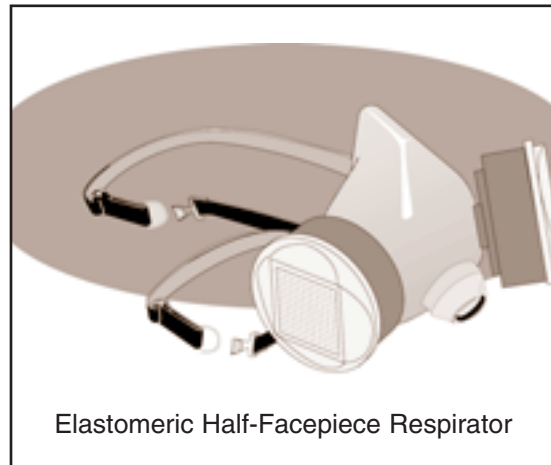
Regardless of which respirator is selected, the device should be NIOSH-certified and used in the context of a respiratory protection program. Important components of such a program are facepiece fit-testing, respirator maintenance, user training, medical evaluation of users, respiratory protection program evaluation, and recordkeeping.^(112,113)

Disposable and elastomeric, half-facepiece, air-purifying respirators (assigned protection factor: 10)

A half-facepiece respirator covers the wearer's nose and mouth. Because inhalation creates a slight negative pressure inside the facepiece of non-powered, air-purifying respirators with respect to outside, these respirators are also called negative-pressure



Disposable Half-Facepiece Respirator



Elastomeric Half-Facepiece Respirator

respirators. During inhalation, contaminated air can easily enter the facepiece of a negative-pressure respirator at gaps between the facepiece and the respirator wearer's face. Therefore, a complete face-to-facepiece seal is essential for good protection. The findings of a study to evaluate faceseal leaks of an elastomeric half-facepiece respirator showed that 89% of the leaks occurred at the nose or chin or were multiple leaks that included these locations.⁽¹¹⁴⁾ Facial hair (even the stubble of a few days' growth), absence of one or both dentures, and deep facial scars can also prevent a complete seal.

Whereas elastomeric half-facepiece respirators consist of a reusable elastomeric or rubber facepiece and replaceable filters, most disposable respirators are filtering facepieces in which the facepiece is the dust filter. Disposable respirators and replaceable filters can be used until they are difficult to breathe through, damaged, or malodorous.

A disadvantage of any negative-pressure, air-purifying respirator is that resistance to inhalation increases as the filters load with dust. For disposable respirators without exhalation valves, filter loading increases resistance during exhalation as well as inhalation. This effect, combined with the warm, moist air inside the facepiece, is so uncomfortable for some people that they do not wear a respirator as frequently as they should, or they stop wearing one entirely.

As of July 10, 1995, NIOSH began certification of negative-pressure, air-purifying particulate filters under new regulations (42 CFR Part 84).⁽¹¹⁵⁾ All particulate-filtering respirators certified by NIOSH under previous regulations (30 CFR Part 11) were no longer sold after July 10, 1998, and only Part 84 particulate respirators are now available. Part 84 particulate respirators have the prefix TC-84A. Part 84 particulate filters are divided into nine classes, and filters from any class can be selected for protection against inhalation of *H. capsulatum* spores. A filter's class (e.g., N-95) and "NIOSH" are marked on the facepiece, exhalation valve cover, or head straps of disposable respirators, and on filter cartridges and cartridge boxes.

Although Part 84 improved the requirements for particulate filters, the facepiece fitting characteristics of all particulate respirators became exempt from evaluation as a condition of NIOSH certification.⁽¹¹⁶⁾ Thus, only respirators with good fitting characteristics should be purchased, and it is essential that workers are assigned respirators based on the results of facepiece fit-testing. To aid in the selection of filtering facepiece respirators for fit testing, studies have been published on the fitting characteristics of some of them.^(116,117)

The type of head straps on the various disposable and elastomeric half-facepiece respirators is an important but frequently overlooked consideration.

Head strap tension is important for achieving a complete face-to-facepiece seal without sacrificing comfort. Elastomeric facepieces have adjustable straps, which should allow a respirator wearer to make a complete, yet comfortable, facepiece seal. On the other hand, not all disposable respirators have adjustable straps; some simply have fixed-length elastic bands. Most disposable respirators certified under Part 84, do not have adjustable straps, only elastic bands. Research has not been done to evaluate whether the facepiece fits of respirators with adjustable straps differ significantly from those of respirators with elastic bands. However, a respirator user should be aware that the fit and comfort of a disposable respirator with elastic bands might differ from one with adjustable straps.

In dusty conditions, repeated exposure of the eyes to dust increases the risk for injury and disease. Most dust particles entering a person's eyes will be washed out by tears, but some particles can be retained, particularly within the margin of the upper eyelid. Depending on their size, shape, and composition, these particles can become embedded in the surface of the cornea or sclera, where they cause irritation and then reddening of the surface. If not removed, such particles may produce eye infections.⁽¹¹⁸⁾ Therefore, a half-facepiece respirator is a poor choice for use in dusty conditions. While wearing eyecup goggles may provide some eye protection, they are not airtight and do not completely prevent dust exposure. Furthermore, goggles may interfere with a respirator's fit. For these reasons, a full-facepiece respirator is a better alternative when a person's eyes are at risk of exposure to airborne dusts.

Because their assigned protection factors are lower than those of other respirator types, the use of disposable or elastomeric half-facepiece respirators should be limited to situations where risks are low for inhaling material that might be contaminated with *H. capsulatum* spores. Situations that could be considered low risk include site surveys of bird roosts, collecting soil samples, or maintenance on filters of earthmoving equipment. However, during

earthmoving activities at bird roosts or other work sites where the soil is known to be heavily contaminated by *H. capsulatum*, air-purifying, half-facepiece respirators should be worn by equipment operators to supplement dust suppression methods and the use of equipment with cabs.

Powered air-purifying respirators with loose-fitting facepiece and continuous-flow, supplied-air respirators with hood or helmet (assigned protection factor: 25)

A powered air-purifying respirator uses a small battery-operated blower to draw dusty air through attached filters and provides clean air at a constant flow rate of 170 liters per minute (L/min). This flow rate is usually greater than a wearer's breathing rate. Consequently, gaps in a face-to-facepiece seal will leak air outward rather than inward. Another advantage of these respirators is that they provide built-in eye protection. They are also the only respirators that adequately protect bearded workers.

Because powered air-purifying respirators cause almost no breathing resistance, the discomfort that some people experience while wearing a negative-pressure respirator is reduced. Interviews with 117 agricultural workers (53 swine farmers, 46 grain handlers, and 18 poultry farmers), found that powered air-purifying respirators with loose-fitting facepieces were rated best over disposable and elastomeric half-facepiece respirators for breathing ease, communication ease, skin comfort, and in-facepiece temperature and humidity.⁽¹¹⁹⁾ Disposable respirators were rated best for weight and convenience.

Powered air-purifying respirators with particulate filters approved by NIOSH under the regulations of 42 CFR Part 84 have the prefix TC-84A. Only powered air-purifying respirators with high-efficiency filters are approved by NIOSH under Part 84.

Supplied-air respirators are not air-purifying types, but deliver breathing air from an air compressor or compressed air cylinder through a pressurized hose

to the facepiece. Continuous-flow, supplied-air respirators with loose-fitting facepieces also provide a minimum air flow rate of 170 L/min. The maximum air flow rate of a continuous-flow supplied-air respirator may not exceed 425 L/min. Air supply hoses are available in a variety of lengths up to a maximum of 300 feet. All NIOSH-approved, supplied-air respirators have the prefix TC-19C.

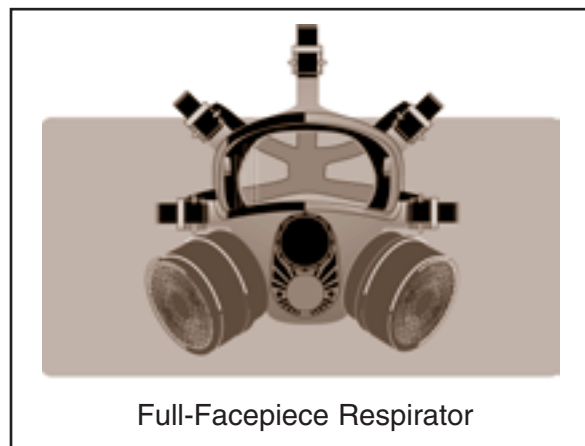
An advantage of a supplied-air respirator is that the source of the breathing air does not depend upon filters to purify ambient air. An advantage of continuous-flow, supplied-air respirators is that when an activity involves work in a hot environment, such as an attic or a chicken house in the summer, a vortex tube can be added to the device that will cool the air flowing to the respirator wearer. A disadvantage of a supplied-air respirator is that if its air supply hose is too short, then mobility of the respirator wearer will be restricted. Also, in some situations (in attics or on elevated structures for example), the trailing hose of a supplied-air respirator can be a tripping hazard.

While the respirators described in this section have higher assigned protection factors than disposable or elastomeric half-facepiece respirators, they may not provide enough protection in extremely dusty conditions where air concentrations of *H. capsulatum* spores may be high, especially in enclosed spaces. Examples of activities for which respirators with higher assigned protection factors may be more important include cleaning chimneys⁽⁶⁶⁾ and working in attics^(58,61,67) and poultry houses.^(74–77)

Air-purifying, full-facepiece respirators; powered air-purifying respirators with half-facepiece or full facepiece; and continuous-flow, supplied-air respirators with half-facepiece or full facepiece (assigned protection factor: 50)

A full-facepiece respirator extends from the forehead to under the chin. It also has the built-in benefit of providing eye protection as well as respiratory

protection. As with other negative-pressure respirators, a complete face-to-facepiece seal is essential for good protection. However, partly because a good fit is easier with a full-facepiece, negative-pressure respirator, this type has a higher assigned protection factor than half-facepiece types. Fogging of a full-facepiece lens can obstruct vision, but this problem is preventable by adding a nose cup inside the facepiece. Antifogging agents in sticks and sprays are also available, but vary in their effectiveness. Most respirator manufacturers sell, but seldom advertise, packages of thin plastic covers for protecting the lens of a full-facepiece respirator. Available at a minimum charge, these replaceable covers prevent scratching of the permanent lens and prolong its life. NIOSH-approved, air-purifying, full-facepiece respirators for protection against particulate exposures have the prefix TC-84A.



Full-Facepiece Respirator

The minimum air flow rate for both a powered air-purifying respirator and a continuous-flow, supplied-air respirator with a half-facepiece or full facepiece is 115 L/min. As with other continuous-flow, supplied-air respirators, the maximum air flow for these devices may not exceed 425 L/min. An air flow of 115 L/min is probably sufficient for most work activities involving possible exposures to aerosolized *H. capsulatum* spores. However, breathing rates during activities requiring heavy exertion may produce peak inhalation air flows exceeding 115 L/min. Consequently, someone

doing heavy work could intermittently overbreathe the respirator's air flow, resulting in brief periods when contaminated air could enter the facepiece at gaps in the face-to-facepiece seal.



Powered Air-Purifying Respirator

The full-facepiece respirators described in this section are recommended as the minimum respiratory protection in extremely dusty conditions where high concentrations of *H. capsulatum* spores could be aerosolized, especially in enclosed areas. Air-purifying, full-facepiece respirators have been recommended for poultry workers based on the results of air sampling during chicken-catching activities inside poultry houses.⁽¹⁰³⁾ As mentioned earlier, half-facepiece respirators provide no eye protection, and even the concurrent use of eyecup goggles is probably impractical in extremely dusty working conditions. Unless the results of quantitative tests suggest that a person wearing an air-purifying, full-facepiece respirator can achieve an outstanding facepiece seal, a powered air-purifying respirator with a full facepiece should be chosen for extremely dusty work.

A powered air-purifying respirator with a full facepiece should also be the minimum respiratory protection worn by someone entering an enclosed area in which the amount of bat and bird manure contamination is unknown. A less protective respirator should be worn only when a site has been evaluated as having a low risk for inhalation exposure to material that might be contaminated with *H. capsulatum*.

Pressure-demand, supplied-air respirators with full facepiece (assigned protection factor: 2,000)

The air regulator of a pressure-demand, supplied-air respirator is designed to maintain positive facepiece pressure even during heavy physical activity. This type of respirator has the same advantages and disadvantages as other supplied-air respirators, except that a vortex tube cannot be used to cool the air delivered to the respirator wearer.



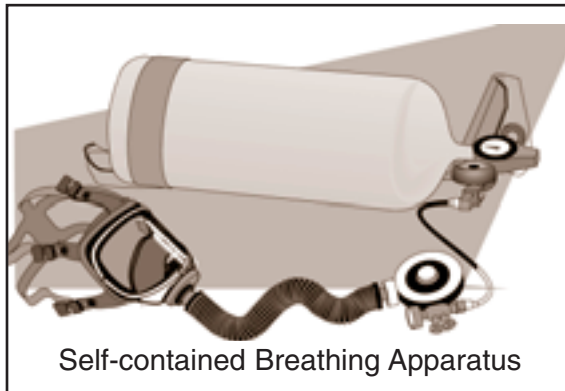
Supplied-air Respirator

Pressure-demand, self-contained breathing apparatuses (SCBA) and combination pressure-demand, supplied-air respirators with auxiliary SCBA (assigned protection factor: 10,000)

Because the wearer of a self-contained breathing apparatus (SCBA) carries his or her own air supply, a pressure-demand SCBA has an advantage of allowing greater mobility than a supplied-air respirator. However, not everyone may agree that this is a significant advantage, since these devices can weigh as much as 40 pounds. Open-circuit SCBAs, like those worn by firefighters, are available with rated service lives of 15, 30, 45, and 60 minutes. Auxiliary SCBAs for combination units are available that have service lives ranging from 3 to 60 minutes. Closed-circuit SCBAs, like those worn by members of mine rescue teams, are available with rated service lives from 1 to 4 hours.

SCBAs have been recommended for use by workers in areas contaminated with *H. capsulatum*.

spores,⁽¹⁰⁰⁾ but they are too impractical for most situations where respirators are needed to protect against the inhalation of *H. capsulatum* spores. Another disadvantage, particularly during removal jobs that may take a long time, is that SCBA can be used for only 30 to 60 minutes. Thus, frequent work stoppages are needed to change air cylinders. Also, an adequate supply of full cylinders is needed at a work site.



Self-contained Breathing Apparatus

Combination pressure-demand, supplied-air respirators with auxiliary SCBA would be useful for very dusty work environments. The auxiliary SCBA could be used to escape to an area of fresh air whenever delivery of breathing air is interrupted. All NIOSH-approved SCBA and combination SCBA and supplied-air respirators have the prefix TC-13F.

Summary

Because of the need for mobility, most decisions concerning the appropriate respirator for protecting against inhalation exposure to material that might contain *H. capsulatum* spores will involve choosing the most appropriate air-purifying respirator. To help the reader with this decision, Table 1 summarizes the advantages and disadvantages of air-purifying respirators and their costs.

What personal protective equipment other than respirators should workers wear?

Disposable protective clothing and shoe coverings should be worn whenever regular work clothing and

shoes might be contaminated with dust containing *H. capsulatum* spores.^(44,57,58) Wearing such clothing can reduce or eliminate the likelihood of transferring spore-contaminated dust to places away from a work site, such as a car or home. When spore-contaminated material is likely to fall from overhead, workers should wear disposable protective clothing with hoods.⁽⁵⁸⁾ Workers should wear disposable shoe coverings with ridged soles made of slip-resistant material to reduce the likelihood of slipping on wet or dusty surfaces. After working in a spore-contaminated area and before removing respirators, workers should remove all protective clothing and shoe coverings and seal them in heavy-duty plastic bags to be disposed of in a landfill.⁽¹²⁰⁾

Since the personal protective equipment described above can be more insulating than regular work clothing, sweat evaporation may be impeded during some work activities. Therefore, precautions may need to be taken to control heat stress. For example, when protective clothing is needed, wearing a lightweight, cotton coverall would create less of a heat-stress risk for a worker than wearing a chemical-resistant suit. Additionally, workers should know the symptoms of heat-stress-related illnesses and be able to take appropriate measures to ensure that such illnesses do not occur. Some jobs may have such a significant risk of heat stress that they should be scheduled only when ambient temperatures are relatively cool.

Wearing chemical-resistant gloves will seldom be necessary when working in a spore-contaminated area. If they are worn, care should be taken to avoid the harmful effects on the skin that can result from occlusion (physical process of trapping a material against the skin), sweating, and maceration (softening and breaking down of tissue).^(121,122) A thin cotton glove can be worn inside a chemical-resistant glove to protect against dermatitis, which can occur from prolonged skin exposure to moisture in gloves caused by perspiration. Because wearing chemical-resistant gloves can aggravate existing dermatitis, their use by workers having dermatitis may not be appropriate. The medical treatment of workers

Table 1. Air-Purifying Respirators

Respirator type	NIOSH assigned protection factor ⁽¹⁰⁶⁾	Advantages	Disadvantages	Cost (2004 dollars)
Filtering facepiece (Disposable)	10	<ul style="list-style-type: none"> – lightweight – no maintenance or cleaning needed – no effect on mobility 	<ul style="list-style-type: none"> – provides no eye protection – can add to heat burden – inward leakage at gaps in face seal – some do not have adjustable head straps – difficult for a user to do a seal check – level of protection varies greatly among models – communication may be difficult – fit testing required to select proper facepiece size – some eyewear may interfere with the fit 	\$0.70 to \$10
Elastomeric half-facepiece	10	<ul style="list-style-type: none"> – low maintenance – reusable facepiece and replaceable filters and cartridges – no effect on mobility 	<ul style="list-style-type: none"> – provides no eye protection – can add to heat burden – inward leakage at gaps in face seal – communication may be difficult – fit testing required to select proper facepiece size – some eyewear may interfere with the fit 	facepiece: \$12 to \$35 filters: \$4 to \$8 each
Powered with loose-fitting facepiece	25	<ul style="list-style-type: none"> – provides eye protection – protection for people with beards, missing dentures or facial scars – low breathing resistance – flowing air creates cooling effect – face seal leakage is generally outward – fit testing is not required – prescription glasses can be worn – communication less difficult than with elastomeric half-facepiece or full-facepiece respirators – reusable components and replaceable filters 	<ul style="list-style-type: none"> – added weight of battery and blower – awkward for some tasks – battery requires charging – air flow must be tested with flow device before use 	unit: \$400 to \$1000 filters: \$10 to \$30
Elastomeric full-facepiece with N-100, R-100, or P-100 filters	50	<ul style="list-style-type: none"> – provides eye protection – low maintenance – reusable facepiece and replaceable filters and cartridges – no effect on mobility – more effective face seal than that of filtering facepiece or elastomeric half-facepiece respirators 	<ul style="list-style-type: none"> – can add to heat burden – diminished field-of-vision compared to half-facepiece – inward leakage at gaps in face seal – fit testing required to select proper facepiece size – facepiece lens can fog without nose cup or lens treatment – spectacle kit needed for people who wear corrective glasses 	facepiece: \$90 to \$240 filters: \$4 to \$8 each nose cup: \$30
Powered with tight-fitting half-facepiece or full-facepiece	50	<ul style="list-style-type: none"> – provides eye protection with full-facepiece – low breathing resistance – face seal leakage is generally outward – flowing air creates cooling effect – reusable components and replaceable filters 	<ul style="list-style-type: none"> – added weight of battery and blower – awkward for some tasks – no eye protection with half-facepiece – fit testing required to select proper facepiece size – battery requires charging – communication may be difficult – spectacle kit needed for people who wear corrective glasses with full face-piece respirators – air flow must be tested with flow device before use 	unit: \$500 to \$1000 filters: \$10 to \$30

Note: The assigned protection factors in this table are from the *NIOSH Respirator Selection Logic*.⁽¹⁰⁶⁾ When the table was prepared, OSHA had proposed amending the respiratory protection standard to incorporate assigned protection factors.⁽¹⁰⁷⁾ The Internet sites of NIOSH (www.cdc.gov/niosh) and OSHA (www.osha.gov) should be checked for the current assigned protection factor values.

having dermatitis and decisions about their use of gloves should be supervised by a physician experienced with occupational skin diseases.⁽¹²²⁾

What other infectious agents are health risks for workers who disturb accumulations of bat droppings or bird manure?

In addition to *H. capsulatum*, inhalation exposure to *Cryptococcus neoformans* may also be a health risk for workers in environments containing accumulations of bat droppings or bird manure. Inhalation exposures to *Chlamydia psittaci* have occurred occasionally in environments containing the manure of certain birds, and exposure to the rabies virus is a health risk for workers who must handle dead bats.

Cryptococcus neoformans

C. neoformans is the infectious agent of the fungal disease cryptococcosis. Formerly a rare disease, the incidence of cryptococcosis has increased in recent years because of its frequent occurrence in AIDS patients.^(123–127) *C. neoformans* and *H. capsulatum* are only two of the more than 100 microorganisms that have been reported with increased frequency among HIV-infected persons, and cryptococcosis and histoplasmosis are both classified as AIDS-indicator opportunistic infectious diseases.⁽¹²⁷⁾ In 1997, the USPHS/IDSA Prevention of Opportunistic Infections Working Group recommended that HIV-infected persons should avoid “sites that are likely to be heavily contaminated with *C. neoformans* (e.g., areas heavily contaminated with pigeon droppings).”⁽¹²⁸⁾ However, evidence is lacking that contaminated bird manure is the primary environmental source of exposure to *C. neoformans* in most cases of cryptococcosis among HIV-infected persons.⁽¹²⁵⁾ Thus, the 2001 USPHS/IDSA guidelines do not include the pigeon droppings example.⁽⁸⁹⁾ An HIV-infected person should consult his or her health care provider about the appropriate exposure precautions to be taken for any activity having a risk of exposure to *C. neoformans*.

C. neoformans uses the creatinine in avian feces as a nitrogen source. It gains a competitive advantage over other microorganisms and multiplies exceedingly well in dry bird manure accumulated in places that are not in direct sunlight.^(38,123) This microorganism is commonly associated with old pigeon manure, but it has also been recovered from dried excreta of chickens, sparrows, starlings, and other birds.⁽¹²³⁾ As with *H. capsulatum*, *C. neoformans* has not been found in fresh bird droppings, but it has been cultured from the beaks and feet of pigeons.⁽¹²³⁾ Bats have been shown to be infected with *C. neoformans*,⁽¹²⁹⁾ and both *C. neoformans* and *H. capsulatum* have been recovered from bat dropping samples collected at the same site.^(66,67) However, it should not be assumed that a worker’s illness is cryptococcosis when only *C. neoformans* is recovered from environmental samples collected from suspected sources of exposure. *C. neoformans* has been recovered from environments where *H. capsulatum* was not recovered, even though sick workers were diagnosed from the results of clinical tests as having histoplasmosis.^(61,86)

Unlike outbreaks of other mycoses, outbreaks of cryptococcosis traced to environmental sources have not been described, and it is presumed that most people can overcome most inhalation exposures to *C. neoformans*.⁽¹²⁴⁾ More detailed information about *C. neoformans* and cryptococcosis is available in other reports.^(123,124,130–133) Work practices described previously in this document for controlling exposures to *H. capsulatum*, including the use of personal protective equipment, will also protect against inhalation exposures to *C. neoformans* and other microorganisms.

Chlamydia psittaci

Psittacosis is caused by a bacterium (*C. psittaci*) rather than a fungus, but it is another infectious disease that people can develop after disturbing and inhaling contaminated bird manure. While *C. psittaci* has been isolated from approximately 130 avian species,⁽¹³⁴⁾ most human infections result from inhalation exposures to aerosolized urine,

respiratory secretions, or dried manure of infected psittacine (parrot-type) birds, such as cockatiels, parakeets, parrots, and macaws; avian chlamydiosis is diagnosed less frequently in canaries and finches.⁽¹³⁵⁾ Among caged, nonpsittacine birds, infection with *C. psittaci* occurs most frequently in pigeons, doves, mynah birds. Psittacosis in humans has occasionally been associated with exposures to infected pigeons, turkeys, chickens, ducks, pheasants, and geese, or their manure.^(83,134,136–138)

According to the CDC's annual summaries of notifiable diseases, 904 cases of psittacosis in humans were reported to CDC from 1988 through 2003 (range: 15 cases in 2003 to 116 cases in 1989). Psittacosis is not a notifiable disease in all states, and thus, the actual number of cases is likely to be higher. Also, the number of cases may be underestimated because the disease is difficult to diagnose and cases often go unreported.⁽¹³⁵⁾ The severity of disease experienced by an infected person can range from asymptomatic to severe systemic disease with pneumonia; death occurs in less than 1% of properly treated patients.⁽¹³⁵⁾

The National Association of State Public Health Veterinarians has recommended that workers should wear protective clothing, gloves, and a respirator with filters having an N-95 rating or higher when cleaning cages or handling birds infected with *C. psittaci*.⁽¹³⁵⁾

Rabies

Rabies is a viral disease caused by infection of the central nervous systems of wild and domestic animals and humans.⁽¹³⁹⁾ The initial symptoms of human rabies resemble those of other systemic viral infections, including fever, headache, malaise, and disorders of the upper respiratory and gastrointestinal tracts.⁽¹⁴⁰⁾ Recognizing that a person has been exposed to the virus and prompt treatment are essential for preventing rabies. For once clinical symptoms have begun, there is no treatment for rabies and almost all patients will die from the disease or its complications within a few weeks of onset.^(139,140)

In the United States, wild animals (especially bats, raccoons, skunks, coyotes, and foxes) are the most important sources of rabies infection.^(141–143) Indigenous rabid bats have been reported from every state except Hawaii.^(141–143) Individual bats from most of the estimated 41 bat species in the United States have been found to be infected with rabies virus.⁽¹⁴⁵⁾ Rabies virus associated with insectivorous bats (those that feed principally on insects) accounted for 32 of the 35 indigenous rabies cases in humans in the United States between 1958 and 2000.⁽¹⁴⁵⁾

Rabies is transmitted via an infected animal's bite or by contamination of abrasions, open wounds, mucous membranes or theoretically, scratches, by infectious material such as saliva.⁽¹⁴⁴⁾ Contact with the blood, urine, or manure of a rabid animal is not a risk factor for contracting rabies.⁽¹⁴⁴⁾ Consequently, workers exposed to accumulations of bat droppings in environments from which bats have been excluded have no rabies risk. Although spelunkers seldom have direct contact with bats, they are included in a frequent-risk category by CDC because of potential for bite, nonbite, or aerosol exposure to the rabies virus.⁽¹⁴⁴⁾ Two fatal cases of rabies in humans have been attributed to possible airborne exposures in caves containing millions of free-tailed bats.⁽¹⁴⁴⁾ In addition, between 1990 and 2000, a bite was documented in only 2 of the 24 U.S. human rabies cases caused by bat-associated rabies virus variants.⁽¹⁴⁶⁾ This suggests "that transmission of rabies virus can occur from minor, seemingly unimportant, or unrecognized bites from bats."⁽¹⁴⁴⁾ While aerosol transmission of the rabies virus from bats to people is theoretically possible under extraordinary conditions, the risk is otherwise negligible.

The percentage of rabid bats in any colony is probably low (0.5% or less⁽⁹⁵⁾). However, a dead bat should still never be picked up with bare hands since its death may have been caused by an infectious agent. The rabies virus can remain infectious in a carcass until decomposition is well advanced.⁽⁹⁴⁾ Thus, whenever possible, a shovel or some other

tool should be used to pick up and dispose of a dead bat. If a dead bat must be handled, wearing heavy work gloves should minimize the risk of disease transmission because of an accidental scratch from the bat's teeth or by contamination of existing scratches or abrasions on a worker's hands.

Where can I get more information about infectious diseases and answers to questions about worker health and safety issues?

This guidance document was prepared by the National Institute for Occupational Safety and Health (NIOSH) and the National Center for

Infectious Diseases (NCID), both of the Centers for Disease Control and Prevention. For more information about histoplasmosis or other infectious diseases, please contact your physician, your local health department, or NCID in Atlanta, Georgia, NCID's Internet address is <http://www.cdc.gov/ncidod/>. For more information about worker health and safety precautions during disturbances of soil, bat droppings, or bird manure that might be contaminated with *H. capsulatum* spores, call NIOSH in Cincinnati, Ohio, at (800) 356-4674. A list of non-powered, air-purifying respirators that have been tested and approved by NIOSH under 42 CFR Part 84 regulations can be found on the NIOSH Internet home page, <http://www.cdc.gov/niosh>.

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Appendix

HISTOPLASMOSIS

What is histoplasmosis?

Histoplasmosis is an infectious disease caused by inhaling spores of a fungus called *Histoplasma capsulatum*. Histoplasmosis is not contagious; it cannot be transmitted from an infected person or animal to someone else.

What are the symptoms of histoplasmosis?

Histoplasmosis primarily affects a person's lungs, and its symptoms vary greatly. The vast majority of infected people are asymptomatic (have no apparent ill effects) or they experience symptoms so mild they do not seek medical attention. If symptoms do occur, they will usually start within 3 to 17 days after exposure, with an average of 10 days. Histoplasmosis can appear as a mild, flu-like respiratory illness and has a combination of symptoms, including malaise (a general ill feeling), fever, chest pain, dry or nonproductive cough, headache, loss of appetite, shortness of breath, joint and muscle pains, chills, and hoarseness. A chest X-ray of a person with acute pulmonary histoplasmosis will commonly show a patchy pneumonitis, which eventually calcifies. Chronic lung disease due to histoplasmosis resembles tuberculosis and can worsen over months or years. The most severe and rare form of this disease is disseminated histoplasmosis, which involves spreading of the fungus to other organs outside the lungs.

Who can get histoplasmosis?

Anyone working at a job or present near activities where material contaminated with *H. capsulatum* becomes airborne can develop histoplasmosis if enough spores are inhaled. After an exposure, how ill a person becomes varies greatly and most likely depends on the number of spores inhaled and a person's age and susceptibility to the disease. The number of inhaled spores needed to cause disease is unknown. Children younger than 2 years of age, persons with compromised immune systems, and

older persons, in particular those with underlying illnesses such as diabetes and chronic lung disease, are at increased risk for developing symptomatic histoplasmosis.

People with weakened immune systems are at greatest risk for developing severe and disseminated histoplasmosis. Included in this high-risk group are persons with AIDS or cancer and persons receiving cancer chemotherapy; high-dose, long-term steroid therapy; or other immuno-suppressive drugs.

Before 2000, a person could learn from a histoplasmin skin test whether he or she had been previously infected by *H. capsulatum*. However, the manufacturing of histoplasmin was discontinued in 2000, and the skin testing reagents were still unavailable in 2004. A previous infection can provide partial immunity to reinfection. Since a positive skin test does not mean that a person is completely immune to reinfection, appropriate exposure precautions should be taken regardless of a worker's past skin-test status whenever disturbances of materials that might be contaminated with *H. capsulatum* occur.

What is the treatment for histoplasmosis?

Mild cases of histoplasmosis are usually resolved without treatment. For severe cases, special antifungal medications are needed to arrest the disease. Disseminated histoplasmosis is fatal if untreated, but death can also occur in some patients even when medical treatment is received.

Where are *H. capsulatum* spores found?

H. capsulatum grows in soils throughout the world. In the United States, the fungus is endemic (more prevalent) and the proportion of people infected by *H. capsulatum* is higher in central and eastern states, especially along the Ohio and Mississippi River valleys. The fungus seems to grow best in soils having a high nitrogen content, especially

those enriched with bat droppings or bird manure. Disturbances of contaminated material cause small *H. capsulatum* spores to become airborne or aerosolized. Once airborne, spores can easily be carried by wind currents over long distances.

How can someone know if soil or droppings are contaminated with *H. capsulatum* spores?

To learn whether soil or droppings are contaminated with *H. capsulatum* spores, samples must be collected and cultured. Presently, the method used to isolate *H. capsulatum* is expensive and requires several weeks to complete. If not enough samples are collected, small but highly contaminated areas can be overlooked. Until a less expensive and more rapid method is available, testing samples for *H. capsulatum* will continue to be impractical for most situations. Consequently, when thorough testing is not done, the safest approach is to assume soil in endemic regions and any accumulations of bat droppings or bird manure are contaminated with *H. capsulatum* and take appropriate exposure precautions.

What jobs and activities have risks for exposure to *H. capsulatum* spores?

Below is a partial list of occupations and hobbies with risks for exposure to *H. capsulatum* spores. Appropriate exposure precautions should be taken by these people and others whenever contaminated soil, bat droppings, or bird manure is disturbed.

- ◆ Bridge inspector or painter
- ◆ Chimney cleaner
- ◆ Construction worker
- ◆ Demolition worker
- ◆ Farmer
- ◆ Gardener
- ◆ Heating and air-conditioning system installer or service person
- ◆ Microbiology laboratory worker
- ◆ Pest control worker
- ◆ Restorer of historic or abandoned buildings
- ◆ Roofer
- ◆ Spelunker (cave explorer)

How can exposure to *H. capsulatum* be controlled and histoplasmosis prevented?

The best way to prevent exposures to *H. capsulatum* spores is to avoid situations where material that might be contaminated can become aerosolized and subsequently inhaled. This is especially important for persons with weakened immune systems.

Dust suppression methods, such as carefully wetting with a water spray, may be useful for reducing the amount of material aerosolized during an activity. For some activities, such as removing an accumulation of bat droppings or bird manure from an enclosed place such as an attic, wearing a NIOSH-approved respirator and other items of personal protective equipment may be needed to further reduce the risk of *H. capsulatum* exposure. However, only persons trained in the proper selection and use of personal protective equipment should undertake work where this equipment is needed.

Disinfectants have occasionally been used to treat soil and accumulated bat manure when removal was impractical or as a precaution before a removal process was started. There is no product or chemical that is registered by the EPA that has the specific claim of being effective against *H. capsulatum*. A manufacturer of a product claiming to disinfect soil contaminated with *H. capsulatum* will have to meet the EPA's regulatory requirements and complete the registration process.

Where can I get more information about histoplasmosis?

This histoplasmosis fact sheet was prepared by the National Institute for Occupational Safety and Health (NIOSH) and the National Center for Infectious Diseases (NCID), both of the Centers for Disease Control and Prevention. For answers to other questions about histoplasmosis or histoplasmin skin-testing, please contact your physician, your local health department, or NCID in Atlanta, Georgia. NCID's Internet address is <http://www.cdc.gov/ncidod/>. For other questions about worker health and safety precautions during disturbances of soil, bat droppings, or bird manure that might be contaminated with *H. capsulatum* spores, call NIOSH in Cincinnati, Ohio, at (800) 356-4674.

HISTOPLASMOSIS

¿Qué es la histoplasmosis?

La histoplasmosis es una enfermedad infecciosa causada por la inhalación de esporas de un hongo llamado *Histoplasma capsulatum*. La histoplasmosis no es contagiosa; no puede ser transmitida de una persona o animal enfermo a alguien sano.

¿Cuales son los síntomas de la histoplasmosis?

La histoplasmosis afecta principalmente los pulmones y sus síntomas son muy variables. La gran mayoría de las personas infectadas son asintomáticas (no tienen efectos aparentes de enfermedad) o presentan síntomas tan leves que no requieren atención médica. Cuando hay síntomas, éstos generalmente empiezan 3 a 17 días después de la exposición, con un promedio de 10 días. La histoplasmosis puede aparecer como una enfermedad respiratoria leve tipo influenza y tiene una combinación de síntomas que incluyen decaimiento (sensación de enfermedad), fiebre, dolor en el pecho, tos seca o no productiva, dolor de cabeza, pérdida de apetito, disnea (dificultad para respirar), dolores musculares y de articulaciones, calofríos y ronquera. Una radiografía de tórax de una persona con histoplasmosis pulmonar aguda muestra con frecuencia una neumonitis desigual que se calcifica eventualmente. La enfermedad pulmonar crónica por histoplasmosis se parece a la tuberculosis y puede empeorar a través de los meses o años. La forma más severa y rara de esta enfermedad es la histoplasmosis diseminada, que involucra la invasión del hongo a otros órganos fuera de los pulmones.

¿Quién puede contraer histoplasmosis?

Cualquier persona que trabaje o esté presente cerca de actividades en donde el material contaminado con *H. capsulatum* se haga volátil, puede desarrollar histoplasmosis si inhala suficientes esporas. Después de una exposición, la severidad de la enfermedad es muy variable y probablemente dependa del número de esporas inhaladas y de la edad y susceptibilidad de la persona a contraer la enfermedad. El número de esporas que es necesario inhalar para contraer la enfermedad es desconocido. Los niños menores de dos años, las personas con sistemas inmunes comprometidos y los adultos mayores, en particular aquellos con enfermedades subyacentes tales como diabetes y enfermedad pulmonar crónica, tienen un mayor riesgo de desarrollar histoplasmosis sintomática.

Las personas con deficiencias del sistema inmune sufren mayor riesgo de desarrollar histoplasmosis severa y diseminada. Incluidos en este grupo de alto riesgo se encuentran las personas con SIDA o cáncer y las personas que están recibiendo quimioterapia, terapia con altas dosis de esteroides por tiempo prolongado o terapia con otros medicamentos inmunosupresores.

Antes del año 2000, una persona podía saber si había sido infectada previamente con *H. capsulatum* a través de una prueba cutánea con histoplasmina. Sin embargo, la fabricación de histoplasmina se discontinuó en 2000, y los reactivos para hacer la prueba cutánea seguían sin estar disponibles en el 2004. Una infección previa puede otorgar inmunidad parcial contra una reinfección. Dado que una prueba cutánea positiva no significa que una persona sea completamente inmune a una reinfección, deben ser adoptadas medidas apropiadas de protección contra la exposición. Estas medidas deberán ser adoptadas, independientemente de los resultados de la prueba cutánea, por aquellos trabajadores que manipulen materiales que puedan estar contaminados con *H. capsulatum*.

¿Cuál es el tratamiento de la histoplasmosis?

Los casos leves de histoplasmosis usualmente se resuelven sin tratamiento. Los casos severos requieren medicamentos especiales antihongos (fungicidas) para controlar la enfermedad. La histoplasmosis diseminada es mortal si no se trata, pero la muerte también puede ocurrir aún cuando se reciba tratamiento médico.

¿Dónde se encuentran las esporas de *H. capsulatum*?

El *H. capsulatum* se encuentra en suelos de todo el mundo. En los Estados Unidos, el hongo es endémico (más prevalente) y la proporción de gente infectada por *H. capsulatum* es mayor en los estados del este y el centro, sobre todo a lo largo de los valles de los ríos Ohio y Mississippi. El hongo parece crecer mejor en suelos con alto contenido de nitrógeno, especialmente aquellos enriquecidos con guano de murciélago o estiércol de pájaro. La manipulación de material contaminado hace que las pequeñas esporas de *H. capsulatum* se hagan volátiles o se conviertan en aerosol. Una vez volátiles, las esporas pueden ser fácilmente transportadas por corrientes de viento a grandes distancias.

¿Cómo se puede saber si el suelo o el guano están contaminados con esporas de *H. capsulatum*?

Para saber si el suelo o el guano están contaminados con esporas de *H. capsulatum*, se deben tomar muestras para cultivo. Actualmente, el método usado para aislar *H. capsulatum* es caro y requiere varias semanas para completarlo. Si no se toman suficientes muestras, pueden ignorarse áreas pequeñas pero muy contaminadas. Hasta que exista un método más rápido y menos caro, el examen de muestras seguirá siendo poco práctico en la mayoría de las situaciones. En consecuencia, cuando no se hace un examen extensivo, el enfoque más seguro es asumir que el suelo en regiones endémicas y cualquier acumulación de guano de murciélago o estiércol de pájaro, están contaminados con *H. capsulatum* y, por lo tanto, tomar las medidas necesarias para prevenir la exposición.

¿Qué trabajos y actividades tienen riesgo de exposición a *H. capsulatum*?

A continuación hay una lista parcial de ocupaciones y pasatiempos que tienen riesgo de exposición a esporas de *H. capsulatum*. Estas personas deben tomar medidas adecuadas para prevenir la exposición siempre que se manipule suelo contaminado, guano de murciélago o estiércol de pájaro.

- ◆ Inspector o pintor de puentes
- ◆ Limpiador de chimeneas
- ◆ Trabajador de la construcción
- ◆ Trabajador de demolición
- ◆ Granjero, trabajador agrícola
- ◆ Jardinero
- ◆ Instalador o agente de servicio de sistemas de aire acondicionado y calefacción
- ◆ Trabajador de laboratorio microbiológico
- ◆ Trabajador de control de plagas
- ◆ Restaurador de edificios históricos o abandonados
- ◆ Trabajador de techos
- ◆ Explorador de cuevas

¿Cómo se puede controlar la exposición a *H. capsulatum* y prevenir la histoplasmosis?

La mejor forma de prevenir la exposición a las esporas de *H. capsulatum* es evitar aquellas situaciones donde materiales contaminados puedan hacerse

volátiles y las esporas ser posteriormente inhaladas. Esto es importante sobre todo para aquellas personas con depresión del sistema inmune.

Los métodos de supresión de polvo, tal como humedecer cuidadosamente con un aspersor de agua, pueden ser útiles para reducir la cantidad de material que se volatiliza durante una actividad. Para algunas actividades, tales como remover una acumulación de guano de murciélago o estiércol de pájaro de un lugar cerrado, como un ático, se debe usar un respirador aprobado por NIOSH. Otros artículos de protección personal pueden ser necesarios para disminuir el riesgo de exposición a *H. capsulatum*. Sin embargo, sólo las personas capacitadas en la selección y el uso adecuados del equipo de protección personal deben llevar a cabo actividades donde este equipo sea requerido.

Ocasionalmente se han usado desinfectantes para tratar el suelo y la acumulación de guano de murciélago, cuando la remoción no es práctica, o como una precaución antes de iniciar el proceso de remoción. No existe producto o agente químico registrado por la EPA (Agencia de Protección Ambiental) que sea efectivo contra *H. capsulatum*. El fabricante de algún producto que afirme que desinfecta el suelo contaminado con *H. capsulatum* tendrá que cumplir con los requisitos regulatorios de la EPA y completar el proceso de registro.

¿Dónde se puede obtener más información sobre la histoplasmosis?

Esta hoja informativa sobre la histoplasmosis fue preparada por el Instituto Nacional de Salud y Seguridad Ocupacional (NIOSH) y el Centro Nacional de Enfermedades Infecciosas (NCID), ambos de los Centros de Control y Prevención de Enfermedades. Para respuestas a otras preguntas sobre histoplasmosis, por favor contacte a su médico, a su departamento de salud local, o al NCID en Atlanta, Georgia. La dirección de Internet del NCID es <http://www.cdc.gov/ncidod/>. Para otras consultas sobre la salud de los trabajadores y medidas de precaución a usar durante la manipulación de suelo, guano de murciélago o estiércol de pájaro potencialmente contaminados con esporas de *H. capsulatum*, llame a NIOSH en Cincinnati, Ohio, al teléfono (800) 356-4674.

How Pigeons Became Rats: The Cultural-Spatial Logic of Problem Animals

<https://www.jstor.org/stable/10.1525/sp.2008.55.1.72>

Abstract

How do animals become problems? Drawing on interactionist theories of social problems and cultural geography, I argue that the construction of animals as problems relies upon cultural understandings of nature/culture relationships, which in turn entail "imaginative geographies." Specifically, modernity posits a firm boundary between nature and culture. Animals have their place, but are experienced as "out of place"—and often problematic—when they are perceived to transgress spaces designated for human habitation. Relying on New York Times articles from 1851 to 2006, and articles from 51 other newspapers from 1980 to 2006, this article focuses on the process by which pigeons as a species were problematized. I contend that pigeons have come to represent the antithesis of the ideal metropolis, which is orderly and sanitized, with nature subdued and compartmentalized. While typified as a health issue, the pigeon's primary "offense" is that it "pollutes" habitats dedicated for human use. The catch phrase "rats with wings" neatly summarizes society's evaluations of, and anxieties about, this bird. This metaphor reflects a framing of pigeons by claims-makers that renders them out of place in the cityscape. This study expands social problems theorizing to more thoroughly account for animals and the role of space.

Journal Information

Published quarterly for the Society for the Study of Social Problems, Social Problems tackles the most difficult of contemporary society's issues and brings to the fore influential sociological findings and theories enabling readers to gain a better understanding of the complex social environment. Areas covered by the journal include: conflict and social action; crime and juvenile delinquency; drinking, drugs, and addiction; health policy and services; race and ethnicity; and sexual behavior and politics. One of the most respected and widely read professional journals in today's social sciences, Social Problems presents accessible, relevant, and innovative articles that maintain critical perspectives of the highest quality.

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How Pigeons Became Rats: The Cultural-Spatial Logic of Problem Animals

Colin Jerolmack, *City University of New York, Graduate Center*

How do animals become problems? Drawing on interactionist theories of social problems and cultural geography, I argue that the construction of animals as problems relies upon cultural understandings of nature/culture relationships, which in turn entail "imaginative geographies." Specifically, modernity posits a firm boundary between nature and culture. Animals have their place, but are experienced as "out of place"—and often problematic—when they are perceived to transgress spaces designated for human habitation. Relying on New York Times articles from 1851 to 2006, and articles from 51 other newspapers from 1980 to 2006, this article focuses on the process by which pigeons as a species were problematized. I contend that pigeons have come to represent the antithesis of the ideal metropolis, which is orderly and sanitized, with nature subdued and compartmentalized. While typified as a health issue, the pigeon's primary "offense" is that it "pollutes" habitats dedicated for human use. The catch phrase "rats with wings" neatly summarizes society's evaluations of, and anxieties about, this bird. This metaphor reflects a framing of pigeons by claims-makers that renders them out of place in the cityscape. This study expands social problems theorizing to more thoroughly account for animals and the role of space. Keywords: animals, nature, culture, space, environment.

Feral pigeons are a problem in cities around the world. In the West, businesses flourish by contracting with local governments to control this *nonnative* "pest." Many cities and towns have criminalized pigeon feeding to control their numbers and the problems linked to them, from potentially fatal diseases to the property damage that can result from their feces. Over the last century, pigeons have been shot, gassed, electrocuted, poisoned, trapped, and fed contraceptives, among other such efforts to repel them including spikes and sticky gel on ledges. Pigeons, more than other so-called "nuisance birds"¹ such as starlings, are a despised species.

A phrase commonly used to represent the popular disdain for pigeons is "rats with wings." Yet, while pigeons have been a part of city life for thousands of years (Levi [1941] 1963), this problematic framing is a recent phenomenon, even within the era of modern cities. While sparrows were once framed as the United States' greatest problem bird (Fine and Christoforides 1991), today it is in reference to pigeons that news articles declare: "Rat of the sky is now public enemy No. 1" (Bildstien 2004). As the human population expands, uneasy cohabitations of humans and animals continue to proliferate. Cougars threaten rural and suburban inhabitants (Baron 2004); deer destroy backyard gardens; and reintroduced wolves in Yellowstone Park bring the ire of farmers (Scarce 2005). As such, the management of animal populations has been a site of bitter social conflict and claims-making (Herda-Rapp and Goedecke 2005).

1. They are labeled such by institutions such as the Audubon Society, and are not protected by the Migratory Bird Act.

The author wishes to thank Amy Wharton and the anonymous reviewers of *Social Problems*, and Mitchell Duneier, William Kornblum, Douglas Porpora, Robert W. Turner III, and Edward T. Walker for comments on previous drafts. Direct correspondence to: Colin Jerolmack, CUNY Graduate Center, Department of Sociology, 365 Fifth Avenue, New York, NY 10016. E-mail: cjerolmack@gc.cuny.edu.

The Pros and Cons of Pigeons



By [Nicole Levy](#) | August 5, 2015 2:08pm

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One hundred pigeons are missing from Washington Square Park. Should we care? [View Full Caption](#)

DNAinfo/Jill Colvin

You can look at pigeons one of two ways: as pooping, disease-ridden pests, or ambassadors of nature in an otherwise urban setting.

Last week's news that [100 pigeons went missing from Washington Square Park](#) — after perhaps being lured and netted by hunters — has polarized New Yorkers. Some were happy to say "good-bye to a huge flock of 'rats,'" as one commenter on our story wrote. Others, like animal activist Tina Trachtenberg, worried about the welfare of ["these innocent, trusting, loving pigeons."](#)

In an attempt to weigh the arguments of both sides, we've listed the pros and cons of pigeons, otherwise known as rock doves, below.

THE CONS:

- With so much food to be scavenged from garbage cans and sidewalks, and with humans feeding them, pigeons in the city [can spend less time searching for sustenance and more time mating](#). That leads to overpopulation — and lots of pigeon droppings.
- Pigeon droppings are associated with three diseases: histoplasmosis, a fungal infection that causes flu-like symptoms; cryptococcosis, another fungal disease; and psittacosis, a bacterial disease characterized by a rash and sometimes pneumonia. (Note: the Department of Health and Mental Hygiene says that contact with droppings doesn't pose a serious health risk; people with compromised immune systems are most likely to contract one of the three diseases.)
- Speaking of pigeon excrement, a single pigeon [excretes 25 pounds of droppings a year](#). Those droppings deface buildings, quicken the pace of their deterioration and add to their costs of maintenance.
- Pigeons are technically an invasive species: colonists [brought them to this country](#) from Europe in the 1600s as barnyard animals, raised to be eaten. (Squab — it's what's for dinner?)

THE PROS:

- Let's not forget that pigeons served this country in both World Wars as [stealthy message carriers](#).
- Pigeons do more than eat and poop: [they can compete in races](#). During a competitive pigeon race, competitors are released simultaneously from one location and the pigeon that makes it home to its own coop first wins.
- Some people find them aesthetically pleasing. Photographer Andrew Garn, who snapped pictures of 5,000 pigeons over the course of four years, told [New York magazine](#) he finds them "really quite beautiful" up close. And we have to admit, the iridescent green and purple neck of a pigeon can be quite beguiling — when the bird isn't pooping on us.

Confront neighbors about their pigeons creating a nuisance

By [Benny L. Kass](#)

<https://www.chicagotribune.com/real-estate/sc-cons-0507-housing-counsel-20150504-column.html>



May 04, 2015 at 2:00 AM

Pigeons can become a nuisance when large groups gather around homes. (Diana Haronis, Getty Images)

Q: I live in a home with a relatively small backyard. The houses surrounding me are all very similar. My neighbor has put up a pigeon coop in the middle of his yard and even added an addition to the coop. At least 50 pigeons leave droppings all over, and during the warmer months, the neighbor whistles for half an hour or so to have the pigeons fly over a few

houses in a circle. Of course, one of them being mine. They also rest on our roof throughout the day. I have called the village to see if this is allowed. The only thing the village did initially was have the neighbor move the structure to the middle of the yard but said it is OK for the birds and the coop to be there. I am sure that this structure is decreasing the value of my home as it is an eye sore, not to mention any potential health issues that I could be facing as a result. Do I have any options with this?

A: Have you discussed your concerns with your neighbor? That's the very first thing any property owner should do whether you live in a single-family home, a condominium or a cooperative housing apartment. There are two reasons for this: First, your neighbor may not be aware of your concerns and may be willing to work toward resolving the matter.

But equally important, should you have to file suit against your neighbor, the first thing a judge will ask is "Have you talked to the neighbor?"

If discussion does not work, I believe in the power of the press. Many years ago, I worked for a small newspaper. Believe it or not, a cow fell off a moving cattle train on the way to the Chicago stockyards, and landed (dead and upside down) in the middle of a city street. The cow was there for two days; the newspaper printed a picture on the front page, and hours after the paper was on the street, the cow was off the street. The city fathers did not like the adverse publicity.

So I would go to your local TV station and ask them to film the neighbor blowing his whistle. I suspect that may get some attention from your local government.

If all else fails, talk with a local attorney about filing what is known as a nuisance lawsuit. In law, there are two kinds of nuisances: public, such as air or water pollution; and private, such as noise from a neighbor, or — as happened in a recent District of Columbia lawsuit — secondhand smoke.

If you can demonstrate your health is affected by the bird droppings, or your peaceful enjoyment is affected by the constant whistling, the judge may grant an injunction. Equally important, often the mere filing of a lawsuit gets the attention of the other side and a compromise resolution is reached out of court.

Disease carried in pigeon feces blinds N.B. woman

Author of the article: Postmedia News Publishing date:

Apr 25, 2011 • April 25, 2011 • 3 minute read by **Michael Staples**

<https://nationalpost.com/news/canada/disease-carried-in-pigeon-feces-blinds-n-b-woman>

FREDERICTON — In just a few weeks, Erica Richards has been transformed from a vibrant 23-year-old who loved nature into a woman who's battling for her life.

In early January, Ms. Richards contracted a potentially fatal condition called cryptococcal meningitis, a fungal disease carried in the feces of pigeons.

The debilitating illness attacks the spine and the brain, causing severe swelling. It left her confined to a hospital bed in a state of delirium for weeks.

But the most devastating consequence of the sickness is that Ms. Richards is now blind.

"Be aware of this disease. It could kill a child in a heartbeat," Ms. Richards said from her hospital bed.

"It could kill a senior in a heartbeat without you even having to worry about the symptoms. It comes on that fast. If you don't realize the symptoms, it could kill you, too."

Ms. Richards' warning comes on the heels of Fredericton city council's approval earlier this month of a recommendation that it toughen its animal-control bylaw to make it illegal to feed pigeons.

While such complaints are unusual, a problem exists on the city's Grandame Street with a property owner who refuses to stop feeding the birds. The pigeons are roosting on roofs and defecating.

The new law will give the city's bylaw enforcement officers the power to ticket and fine offenders.

"Please don't feed the pigeons," Ms. Richards said. "Try to shoo them away, if you see them. . . . It (the disease) is horrible. The pain that you get from this disease is crippling.

"The after-effects are with you for life and you just can't stop thinking about it. I just want other people to know and try to stay away from pigeons."

Oddly enough, Ms. Richards said she has no recollection of ever being anywhere near pigeons.

"I am still wondering to this day where I got it. I could have stepped in it and brought it into the home. I just don't know."

Ms. Richards said the symptoms started with a migraine headache — one that wouldn't go away.

Ms. Richards was admitted to hospital Feb. 10 after many days of intense head pain. Shortly after, she went into a coma-like state.

"When I woke up I thought I had a mask over my eyes, but I was wrong. I was blind. I was recently told that I will be blind for the rest of my life. This is a tough thing for a 23-year-old to go through. . . . My world crumbled around me."

Ms. Richards said the odds of surviving the disease are 50-50.

"However, I managed to make it through," she said, battling tears. "I don't know how, but I am still here, and I am glad because I get to warn everyone else of this."

Dr. Cristin Muecke, a New Brunswick Health Department's regional medical officer, said the disease is often associated with pigeon droppings.

While not being able to speak about a specific case, she said the illness can't be spread from person to person and is more common with someone who has immune problems.

Ms. Richards, however, said she has never had a problem with her immune system and that's what's so puzzling about contracting the affliction.

In the meantime, Ms. Richards said she has no idea when she will be leaving the hospital. When she does leave, she'll have to re-learn everything.

Erica's mother, BeBe Ms. Richards, said her daughter's illness has been a nightmare.

John Ms. Richards agreed with his wife, saying at first they didn't know if their daughter was going to live or die.

"That was hard — very, very hard," he said.

Ms. Richards, meanwhile, said the Canadian National Institute for the Blind is helping her and she's keeping her fingers crossed that she'll get a seeing-eye dog from the MIRA Foundation.

"I do not want anyone else to suffer this agonizing disease and I ask anyone who is feeding pigeons to stop. It's not just a matter of keeping your neighbourhood clean. . . . It's a matter of keeping people healthy."

How To Get Rid Of Pigeons And Keep Them Off Roofs, Barns, And Fences

Written by [Annemaria Duran](#) in [Birds: chickens, birds of prey, etc](#)

<https://countrypests.com/how-to-get-rid-of-pigeons-and-keep-them-off-roofs-barns-and-fences/>

Pigeons can be found in nearly every city and town. While they used to be a beloved bird, they have fallen from favor and are now often referred to as “rats with wings.”

When they descend on a home, business, or a park drastic and sometimes extreme measures are often taken in an attempt to scare them away. (New York City has outlawed feeding pigeons and introduced hawks to scare them away)

Sadly, pigeons can be difficult to get rid of and it can become a costly endeavor.

This article will discuss short and long term methods for keeping pigeons away.

Some of the methods are highly recommended in many articles, but this guide will discuss the pros and cons of each method. It will also discuss why pigeons are an issue for many people.

History Of Modern Pigeons

Pigeons used to be a favored bird. They were raised for meat and eggs. They were used for entertainment and to win wars.

Hundreds of years ago, pigeons were tamed and called doves. As domesticated pigeons escaped, they created feral colonies and flocks.

Until recently, pigeons were considered a great source of meat. The average person didn't have access to imported and shipped meat. Instead, they had to grow it.

Pigeons are very prolific and can reproduce quickly. This made them a good food source. Plus, their meat is high in vitamins. In many areas, pigeon eggs are considered a delicacy. Pigeons were used for meat until chickens emerged as a faster food source.

In World War II and in previous wars, pigeons were used as messenger birds. In fact of the 53 medals given to animals for saving human lives, 32 went to pigeons.

Domestic pigeons were carried to the New World in the 1600s. Because they reproduce so quickly, extra birds were often released into the wild.

Pigeons have no natural predators so they quickly flourished as feral flocks pretty much anywhere they were released.

They tend to especially flourish in the city where food is free and rampant and there are plenty of places to nest.



Photo credit: [Andrey Belenko](#)

Why Are Pigeons A Problem?

Pigeons were not considered an issue until a couple of decades ago when a noted journalist labeled them as rats with wings. After that, it only took a couple of decades for them to lose their popularity with the public.

There are many reasons that pigeons are despised today. First, they reproduce quickly. A pigeon couple can have as many as 6-12

babies a year. Since pigeons have a long lifespan, about 6 years, a flock will grow quickly.

Each pigeon produces several pounds of droppings a year. The birds aren't picky or bothered by their own droppings and use the dung for nests.

Droppings are sticky and work well to cement nests together so it makes it difficult for people to remove without damage to other items. It is also high in acidity so it can damage the paint and other finishes on cars and buildings.

Plus, pigeon droppings can attract ticks and lice, which create other pest problems for people. Excessive droppings in a pigeon attraction can cause trips and slips.

Pigeon poop is also cited as a health issue. Healthy pigeons don't have unhealthy poop. But, urban pigeons often scavenge and eat many foods and things that have illness and bacteria that can spread disease.

And, because pigeons have such a strong homing signal, they rarely leave an area once they have nested down. Generations of pigeons will return to that spot, turning a little issue into a very big issue.

This is seen in parks, where pigeons were once fed. They can overcome the park and make it less habitable for people to enjoy.

But, there are viable solutions for eliminating pigeons as a nuisance. And, it doesn't involve eliminating the species.

- Prolific as many as 12 babies a year
- No natural predators
- Each bird leaves pounds of droppings a year
- Droppings can attract lice and ticks
- Droppings ruin the finish on cars and buildings
- Can cause trips and slips on droppings
- Droppings stain because of high acidity
- Homing instinct means that flocks rarely leave on their own.



Photo Credit: [Frederic Bisson](#)

Difficulties In Getting Rid Of Pigeons

There are many “fixes” that can be found to get rid of pigeons. Unfortunately, many of them only work for a short time, and some of them don't work at all.

Pigeons are difficult to get rid of because they are very persistent and adaptable. Pigeons will continue to return to a place for years.

That means that when a step is taken to discourage pigeons, it has to be continued for a lengthy time. Pigeons from the flock can continue to come back for years to a location.

If the steps are discontinued and a few straggling birds return, a new flock can quickly populate the area.

Another issue arises if pigeons are attracted to a specific area for shelter or food. If the attraction is greater than the discouragement, then pigeons will quickly adapt.

This is often the case for noise repellents, smell repellants, and decoys. Pigeons will quickly learn that the repellant is not lethal and adjust to it.

But, killing pigeons is often illegal or distasteful to many people. And, poisons are often inhumane.

- Pigeons reproduce quickly
- Some of the flock may leave for a while before returning so repellents need to be for long periods
- Pigeons adapt to non-lethal threats quickly

- Decoys are often ignored quickly
- Lethal methods are illegal in many cities

But, there are many humane ways to discourage pigeon problems.

How To Get Rid Of Pigeons

While pigeons are a problem in many areas, they are also not a problem in many areas. One of the best ways to discourage pigeons is to identify the attraction that brings pigeons to the area.

Like many birds, pigeons look for two main things: food and shelter. The shelter needs to be in a safe area, but pigeons aren't usually picky parents.

1. Get Rid Of Food Sources
2. Install Barriers to Nesting Spots
3. Add Spikes To Prevent Roosting
4. Use Reflective Tape To Disorient Pigeons
5. Provide Contraceptive To Pigeon Flocks
6. Add Bird Repellent Gel To Repel Pigeons
7. Run String To Prevent Resting on Ledges
8. Add A Slinky To The Ledges To Stop Perching
9. Add Angles of 45 degrees or More To Prevent Pigeons
10. Install An Ultrasonic Bird Repeller
11. Use Scarecrows To Scare Away Pigeons
12. Trap or Kill Pigeons

1. Eliminate Food Sources Attracting Pigeons

Pigeons love a free meal, like any animal. The most common attraction for pigeons is a ready food source. They can generally find a nesting location close to a food source.

Eliminate all food sources. This includes bird feeders. Several styles of **bird feeders** are designed to only feed smaller birds and won't allow the larger birds to steal food.

Keep pet food put away. Feed your pets in the garage, or put the food away after they have eaten.

Clean up all food scraps. Keep the compost with a lid on it so that pigeons can't scavenge. Close the lid on the trash can and keep food scraps cleaned up.

Look around your neighborhood for possible food sources for the birds. Consider talking with neighbors and businesses in the area to eliminate the attractants.

- Eliminate bird feeders or use pigeon proof- bird feeders
- Put away pet food
- Keep compost in a bin with a lid
- Clean up food scraps and other trash
- Work with neighbors to eliminate other food sources



Photo Credit: [Pino DeMa](#)

2. Install Screens To Bar Nesting

Pigeons can roost about anywhere. They need very little space. Unfortunately, they can destroy a barn, shop, or house eaves.

The next step in getting rid of pigeons is to eliminate their safe spots. Eliminate holes and roosting spots. Place screens over gutter, vents and gaps. Eliminate hiding spots for pigeons.

Hardware cloth or chicken wire can be used to secure empty spaces. Make sure that you screw or staple the screen in place.

Eliminating roosting spots can be difficult because many places that pigeons use are high. But, placing screens over nesting areas and vents will produce more permanent results.

Don't forget to check your outside window sills, rails, and attic vents. Check the openings for utilities and piping for pigeons. You will also want to check under the eaves of your roof, outer buildings, and sheds.

Chicken wire is relatively cheap and easy to install. If you are using chicken wire, make sure to staple it frequently to the area. It will stretch and wrinkle if not secured securely. Chicken wire has little internal structure

- Permanent with little maintenance
- One-time expense
- Can be difficult to install in high or hard-to-reach areas
- Does not harm birds

3. Add Spikes To Roof Eaves To Stop Pigeons From Roosting

Bird spikes have become more popular in recent years. They prevent birds from landing on a roosting spot because they don't allow room for the birds to perch.

But, they are also slightly and unbecoming to many people. Some people prefer to use bird spikes in harder to see areas so that they aren't as visible from the street.

Bird spikes come in **various sizes** and you can choose larger ones that will prevent pigeons from roosting but won't prevent smaller birds from landing on your home.

Spikes are relatively low in cost but must be securely attached to your home, barn, or garage. They are most often used commercially. They are also used on the eaves, roof and window ledges. They can be found on chimneys, overhangs, and beams.

Other places you can consider installing them include fences, gates, and barns. Bird spikes are generally more permanent than other options and don't have to be replaced or repaired often.

- Unsightly to many people
- Permanent and needs little maintenance
- One-time cost
- Does Not Harm Birds

4. Use Bird Reflective Tape To Disorient Pigeons

A more temporary option over spikes is bird reflective tape. The tape reflects the light in patterns and colors. The reflection changes as the sun's position changes.

Bird tape can also be hung in specific areas to confuse pigeons. If it is hung, then the light patterns will change more dramatically with the wind or movement of the tape.

Pigeons don't like the reflective tape because it confuses them. They don't have good depth perception and the reflection of the light can partially blind them. It disorients them.

Reflective tape is usually successful.

But, be aware that the tape can rip and shred with time so it will need to be checked regularly and replaced as needed.

Also, you will want to use it in the quantity suggested. If you use too much, pigeons figure out that it's another decoy and the tape is not as effective.

- Low-cost solution
- Will need to be replaced periodically

- Doesn't work in the dark
- Not visible to most people
- Doesn't cause harm or pain to birds

5. Use Bird Birth Control To Limit Pigeon Flock Growth

This is one of the most effective ways to control pigeons is to stop the rapid growth of the flock. Innolytics produces a bird contraceptive called OvoControl. It comes in the form of bird seed. It causes the eggs of pigeons to not hatch most of the time. This limits flock growth.

It is also an ethical way to deal with pigeons and doesn't involve killing or harming them.

OvoControl feed must be fed to birds on a regular basis to be effective.

In most cases, the main problems caused by pigeons are caused by the sheer numbers of birds in an area.

When the flock population is stalled, then pigeons aren't a major issue and don't cause the damage and inconvenience that many pigeons usually cause.

- Humanely prevents flocks from growing
- Keeps pigeon populations in check
- Creates lasting results

6. Add Bird Repellent Gel To Repel Pigeons

Bird repellent gel is scented. In some cases, the scent repels pigeons. But, the gel really works by feel. It has a slick, gritty feel to it.

Pigeons and other birds don't like the sticky feel on their feet. They usually fly away once they land and feel the gel.

In some situations, homeowners saw the pigeons come back several times and try the gel before permanently quitting the attempts to roost.

Gel will need to be reapplied every 2-3 months in good weather. In poor, wet weather, it will need to be reapplied more often.

It is a popular method because it's not visible or permanent. That makes it a great solution for renters.

Spikes, tape, and gel can be used together. But, they can also be used solo.

If you use the gel to repel pigeons, make sure you apply the right amount. Too much will catch smaller birds and possibly be dangerous to them. The gel doesn't come off of feathers and the Humane Society does not recommend using gel as a deterrent.

1. Gel feel undesirable to birds when they land
2. Gel is not visible
3. Doesn't permanently affect the building
4. Not Recommended By The Humane Society

7. Run String To Prevent Resting On Ledges

Another way to keep pigeons away from a specific area is to run a string along a ledge. It should be kept taut and be about 1-2 inches above the ledge. The string prevents birds from resting on the ledge.

This is a fairly cheap and visually appealing method. It doesn't cost much and can be done with weatherproof string, thin rope, or **fishing wire**.

But, it does need to be strung in a way that keeps it taut. Otherwise, birds can just land and push the string down or away.

Bird Wire is effective and aesthetically pleasing. It is a more popular method than bird spikes. It can be installed by a professional or done in a DIY fashion. Just make sure that it is installed tightly.



Photo credit: [Jasleen Kaur](#)

8. Secure A Slinky Along The Ledges

A slinky makes use of the same principle as spikes and bird wire. It prevents the birds from landing on the ledges. The slinky moves and rolls when the bird tries to land.

Pigeons won't be able to settle or roost on a ledge. And, slinkies are cheap.

They can often be purchased at dollar stores or other discount places.

But, they are more visible than bird wire.

The slinky will need to be attached to the ledge every 6 or 7 loops to keep it secure. It can be nailed, tied, or secured in another manner.

- Slinkies are fairly inexpensive
- Visible to outsiders

9. Add angles of 45 degrees or more to push pigeons off

Pigeons aren't able to roost or rest on an area that has a 45-degree angle. An otherwise perfect ledge or eave will become undesirable and unusable if it has a 45-degree angle.

Attach wood or metal sheathing over window ledges and flat surfaces. This will keep the pigeons from perching or nesting.

- Sheathing can be more costly, depending on the quantity needed
- Can affect the looks
- Aesthetic sheathing can be more costly than simple plywood
- More permanent solution

10. Install The Ultrasonic Bird Repeller

The ultrasonic bird repeller emits a high-frequency sound that humans can't hear. Birds can hear it and the sound is meant to bother them and drive them away.

This is lower on the list because it has mixed reviews. The success of the ultrasonic bird repeller depends on the frequency it is set at. It also depends on the specific varieties and flocks of pigeons in your area.

Some flocks are much more used to noise and other frequencies than other flocks. So the level of success will depend on your specific location and the individual birds you are trying to repel.

It is also supposed to help with other pest animals, but the frequency would be different, based on the animal targeted

11. Use Scarecrows To Scare Away Pigeons

Scarecrows have been used in short-term situations to scare away pigeons. The biggest limitation for using a scarecrow is that pigeons will adapt and realize that the scarecrow poses no threat to them.

In order to prevent or delay the flock ignoring the scarecrow, it should be moved frequently. If it's kept in the same place for long, pigeons will get used to it quickly and return to their normal habits.

Some scarecrows include motion detected reactions. They will light up, make sound, or move when movement is detected.

This helps to scare pigeons away more effectively. Some **scarecrows** will even spray water in the area covered. This scares away pigeons but can be a hassle if you plan to install it on the roof or other high places.

12. Trap Or Kill Pigeons

Trapping and killing pigeons is one method that is often considered. The main problem with trapping pigeons is that traps have to be monitored and action taken consistently.

Pigeons that are relocated and released can quickly find their way back so euthanizing is the only effective outcome of trapping.

But, the sheer numbers of pigeon flocks makes it a lot of work to trap and euthanize the birds.

And, euthanizing isn't usually considered humane. Shooting or killing pigeons is illegal in many urban areas.

Is it legal to kill pigeons? In the United States, killing pigeons is illegal in many states under the Migratory Bird Protection Laws. Some states authorize the killing of pigeons specifically as an exception.

In Australia, lethal methods are legal but should be done by professionals. That's because Australian law is concerned about adult pigeons being killed when it leaves behind young that are dependant on the parents and who will die of starvation.

In the European Union, pigeons can be killed by landowners to protect their crops. Other reasons are illegal. For most, it's a distasteful task, especially when there are other easier and more humane methods available.

Related Questions

Are Pigeons And Dove The Same Bird? Pigeons and doves are not the same bird, but they come from the same bird family. They both belong to the Columbidae family. Even though they are different species, many people refer to them interchangeably. Just like pigeons, doves lay several clutches of eggs a year and reproduce quickly. Plus, a common pigeon is referred to as both a rock dove and a rock pigeon.

The confusion comes from scientific nomenclature, the process of categorizing animals. In English, we differentiate doves and pigeons as different because of their size difference.

However, automatically, they are basically the same bird. Doves have a much better reputation than a pigeon. So if you hate the bird, it's likely you'll call it a pigeon. If you enjoy them, you'll probably call the flock doves.

How Do I Keep Pigeons Off My Roof? Pigeons can be best kept off your roof by first assessing the type of roof you have. If you have a sloped roof that's a 45-degree angle or more, then you should watch for the flat areas. Eaves and ledges are the most common areas for pigeons to roost.

If your roof is flat, then there are many more places for pigeons to roost. You will need to use a variety of methods to keep pigeons away. Consider covering the area with bird wire and distributing a contraceptive. This will both help to keep pigeons from nesting on your roof and reduce the total burden of the flock over time.

Can I Kill Pigeons With Rice? Pigeons won't die from rice. Uncooked rice takes a long time to absorb liquid. By the time the rice has absorbed enough water to swell, the pigeons will have already passed the rice through their system. Using rice is more likely to keep attracting pigeons than to ever eliminate the problem.

Does Alka-Seltzer Work Against Pigeons? Alka-seltzer does not kill pigeons. It used to be believed that the anti-acid would foam and because birds can't pass gas, they would explode. Besides being a horrible way to die, it doesn't work. Birds simply regurgitate the foamy mess back up the same way they feed their young already-eaten food.

Feature Image Credit: [Franco Bianco](#)

How to Get Rid of Pigeons - Overview of All Available Solutions

<https://www.ovocontrol.com/how-to-get-rid-of-pigeons/#get-rid-of-pigeons-from-balcony>

One of the most common questions that people with pigeon problems ask is how to get rid of the birds from roofs, balconies, and industrial facilities. The pigeons are causing at best an inconvenience and at worst a health hazard. Irrespective of the mess, pigeon feces are corrosive and can etch through steel or even concrete.

In this article, we will discuss how to get rid of pigeons using different methods, so that you can easily find the best solution for your scenario.

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How to Get Rid of Pigeons?

1.

Culling Pigeons

- this method includes shooting, poisoning, using traps and even raptors

2.

Reducing Pigeon Reproduction

- this method includes using pigeon birth control, nest destruction and dovecotes combined with egg removal or replacement

3.

Physically Excluding Pigeons

- this method includes using spikes, wires, slides and shock tracks to keep pigeons away

4.

Using Deterrents

-this method includes sonic and ultrasonic emitters, effigies, reflected and direct light sources, propane cannons and trained raptors to deter pigeons

5.

Using Repellents

- this method includes using gels and pastes, optical gels, fogs and vapors to deter pigeons

Comparison Table of 5 Main Methods to Get Rid of Pigeons

Method/Product	Best Used For	Advantages	Disadvantages
Culling			
Shoot	Killing birds	Immediate action, low cost	Generally prohibited in public. Represents a harvest as opposed to a control program
Poison	Killing birds	Immediate action	Non-target risks; socially unacceptable, short-term solution; dead and dying birds
Trap and euthanize	Killing birds	Immediate action	Often unacceptable where people are present. Short-term effects; birds get “trap shy”
Raptors	Predator and prey	Pigeons are a natural prey species; environmentally sound solution	Mating pairs are difficult to attract under most urban conditions. Raptors migrate and will leave the area part of the year
Reduce Reproduction			
Birth Control	Abatement alternative	Gradually but predictably unwinds the pigeon population	Takes some time to work
Nest destruction	Destroy individual nests	Best for a small number of nests where exclusion will be installed	Completely ineffective since the mating pair will just build new ones.
Dovecots combined with egg removal or replacement	Commune with nature in a park	Provides a safe and secure way of harvesting eggs	Ineffective at controlling a population of pigeons; only provides extra housing for the birds.
Physical Exclusion			
Spikes	Rails, perching areas	Inexpensive; can be highly effective under the right set of conditions; easy installation	In best case, will only move birds to the next best location
Bird Wire	Rails, fences, rooflines, perching areas	Useful tool to keep pigeons off perching areas.	More complex installation especially on rooflines
Slides	Narrow perching areas	Inexpensive and relatively easy installation	Only suitable under the appropriate conditions where a slide can be installed.
Netting	Gold standard for physically excluding birds from both large and small areas and structures	Tangible and immediate effect; can represent a permanent fix for problem birds.	Costly installation requiring professionals. Moves the problem to neighboring structures or facilities
Shock track systems	Rails, perching and loafing areas and surfaces	Highly effective in keeping birds off landing and perching areas	Equipment can be complex. Professional installation normally required. More costly than spikes
Deterrents			

Method/Product	Best Used For	Advantages	Disadvantages
Sonic and ultrasonic emitters	Aural harassment	Can be used in larger areas where exclusion is not practical	Birds acclimate to the sounds
Effigies – plastic owl, rubber snake	Visual harassment	Can be effective short term	Birds acclimate to effigies
Reflected and direct light sources	Visual harassment	Can be effective long-term under appropriate conditions	Costs have a wide range; from shiny pie plates or CD's to industrial lasers
Propane cannon	Harassment	Tangible and immediate effects	Birds acclimate and eventually ignore the noise; not suitable for urbanized areas
Trained raptors	Harassment with predators	Pigeons will flee raptors	Pigeons come right back when the birds of prey go home
Repellents			
Gels and pastes	Perching areas	Inexpensive	Can kill smaller birds; requires consistent reapplication
Optical Gel	Perching and loafing areas	Small and inexpensive; easy to install	Not necessarily appropriate for larger areas. Intensive cleaning required.
Fogs and vapors	Large indoor areas	Ideal for large volume structures	Inconsistent action

How to Get Rid of Pigeons from a Balcony

Getting rid of pigeons from small areas like balconies can be resolved with relatively simple common-sense solutions.

1. **Wires.** You can use a wire coil or stainless-steel wire to deter pigeons perching on rails.
2. **Shock Track.** Several suppliers offer a “shock track” system to keep birds off balconies. The shock track does not hurt the bird but provides enough stimulation to make the targeted perching area unattractive.
3. **Netting.** Consider using a netting system to physically exclude the birds from balconies. This is the costliest alternative, although if installed properly it's 100% effective. Newer versions of netting are virtually invisible.
4. **Sound or reflected light.** The easiest way to deter pigeons from your patio, deck, or balcony, is with sound or reflected light. You can achieve this with a wind chime, Mylar balloon, aluminum foil pans or even hanging CD's. The reflected light disorients the birds.
5. **Plastic owl or rubber snake.** Consider using scarecrows (“effigies”). The most common example is a plastic owl or rubber snake. Unfortunately, the effects will most likely be short-lived. The pigeons come to recognize the scarecrow as something that is not a threat.
6. **Spikes.** Consider using anti-perching spikes that you can attach anywhere the birds like to perch. Spikes are best advised for limited areas where the goal is to move the birds someplace else. They are available in different materials from plastic to stainless steel.
7. **Gel Repellants.** You can use gel repellants to ledges where pigeons perch. The gel makes the surface sticky and the birds will try to avoid it. Unfortunately, dust and debris take their toll and reapplication is often necessary. The application of gel repellants is not recommended where there are smaller birds. They can permanently get stuck in the goo

How to Get Rid of Pigeons from a Roof

Getting rid of pigeons from a residential or a commercial roof can be far more challenging. Although some are better than others, all the solutions that apply for keeping pigeons off a balcony (above), can also apply to larger open areas.

1. Consider using a wire coil or stainless-steel wire to deter pigeons from perching on the ridge(s).
2. A “shock track” system might keep birds off rooftops
3. Using wire or netting is appropriate for a roof design that incorporates nooks. You can also apply nets where the pigeons can construct a nest.
4. Solar panels provide excellent harborage for pigeons. Metal grid netting is the most effective method to limit access to the birds.
5. Flat commercial roof styles have their own set of challenges. The first option is to electrify the parapet perching areas. The second option is to install simple spikes. Be aware that pigeons enjoy the comfort of HVAC installations. As a solution, consider netting these units.

How to Get Rid of Pigeons at Industrial Facilities

The basic nature and scope of modern industrial facilities make them highly attractive to pigeons. The design of these facilities is most often open which allows the birds ready ingress and egress. More importantly, pipes, beams, poles, and catwalks offer a wide range of harborage and nesting options. Food sources are typically located nearby and as mobile pests, pigeons can move around freely from one area of the plant to the next.

Pigeons can represent a costly nuisance for plants, and in many cases have been at the facility ever since it was built. Over time, the nests, feces, and debris can cause considerable damage to a plant’s mechanical and electrical components. Furthermore, the [birds’ droppings](#) and other debris add additional [health hazards](#) to an already hazardous area.

Most conventional methods of pigeon mitigation offer little comfort to an industrial facility and decision makers often select culling solutions since everything else is either prohibitively costly or impractical. Methods such as [trapping and poisoning](#) the birds may help alleviate the problem temporarily, however, due to their rapid breeding, pigeons always return and repopulate the very attractive site in a few weeks or months.

While highly effective at smaller sites, physical exclusion is typically not an option at a larger plant. It is simply impossible to cover an oil refinery or power plant with a net.

The more common solutions for smaller scale facilities are only appropriate for the resolution of isolated problems at a larger plant. An area where there is zero tolerance for birds mandates physical exclusion to keep them out, while the overall control strategy needs to focus on abatement.

The following graphic provides an outline of the various options for bird abatement. There are just two alternatives:

1. Increase mortality with the common culling methods, trap, shoot or poison
2. Reduce reproduction with a contraceptive.

The most effective method at a complex installation is a control program based on OvoControl. A [contraceptive](#) has exceptional utility in these large sites where conventional bird control methods may not be appropriate or cost effective.

While baiting birds without killing them may seem counterintuitive to some, the successful long-term use of OvoControl at a wide range of different industrial facilities demonstrates otherwise.

OvoControl provides a safe, easy-to-use, and effective solution for everything from oil refineries to power plants to control the pigeon population for good.

OvoControl reduces the population naturally, through attrition, over time. With continued use, the population declines at a rate of roughly 50%, annually. With a successful contraceptive program, industrial facilities will ultimately drive their pigeon population down by 90 to 95%.

Furthermore, many industrial facilities often have challenging sites for environmental stewardship. Thankfully, OvoControl represents an environmentally benign pigeon mitigation strategy which does not pose secondary risks to raptors or scavengers.

Conclusion

No Single Method or Solution will solve all pigeon problems

Short of exterminating the birds, there is no fool proof way **to get rid of all of them**. Pigeons have accompanied mankind for thousands of years and, like rats, are not leaving anytime soon. Unfortunately, even the effects of lethal methods are only effective in the short-term as the remaining flock rapidly breeds back the ones that are missing. Lethal solutions often represent a “harvest” of pigeons as opposed to an actual control program. Both larger and smaller problems can be solved with the techniques outlined above although all but the simplest sites require some observation and planning to develop a safe and effective strategy for success.

Why Not Just Kill the Birds?

Irrespective of any humane considerations, the casual observer often asks, “why not just kill the birds” for a prompt and effective resolution to a pigeon problem? While culling options provide an immediate and tangible solution to an acute pigeon problem, the effects are fleeting. More often than not, the population will simply “backfill” the void created by culling with increased reproduction and even more birds. Unfortunately, just killing the birds just provides the illusion of control. Only by limiting reproduction can you effectively manage the population in a manner to provide long-term control. Over time, killing pigeons more closely resembles a harvest as opposed to an actual control program.

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CEO, Innolytics, LLC, (est. 2003) focused on developing contraceptive technology for the management of pest birds and other wildlife. **Professional Experience**

40+ years of industry experience (Crop Protection, Animal Health, Pharmaceuticals) US and International

Article

Effectiveness of Gel Repellents on Feral Pigeons

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Simple Summary: Feral pigeons live in close association in urban areas. They constitute serious health risks to humans and also lead to high economic loss due to costly damage to buildings, historic monuments, statues and even vegetation. While numerous avian repellent systems are regularly introduced onto the market, scientific proof of efficacy and their use from the point of view of animal welfare is lacking. Therefore, two avian gel repellents were studied on free-living feral pigeons in this study. The focus was set on repellent efficacy and animal welfare concerns. This study's aim is to contribute to a better understanding of feral pigeon management in our cities.

Abstract: Millions of feral pigeons (*Columba livia*) live in close association with the human population in our cities. They pose serious health risks to humans and lead to high economic loss due to damage caused to buildings. Consequently, house owners and city authorities are not willing to allow pigeons on their buildings. While various avian repellents are regularly introduced onto the market, scientific proof of efficacy is lacking. This study aimed at testing the effectiveness of two avian gel repellents and additionally examined their application from animal welfare standpoint. The gels used an alleged tactile or visual aversion of the birds, reinforced by additional sensory cues. We mounted experimental shelves with the installed repellents in a pigeon loft and observed the behavior of free-living feral pigeons towards the systems. Both gels showed a restricted, transient repellent effect, but failed to prove the claimed complete effectiveness. Additionally, the gels' adhesive effect remains doubtful in view of animal welfare because gluing of plumage presents a risk to feral pigeons and also to other non-target birds. This

study infers that both gels lack the promised complete efficacy, conflict with animal welfare concerns and are therefore not suitable for feral pigeon management in urban areas.

Keywords: capsaicin; *Columba livia*; contact gel; feral pigeon; optical gel; repellent gel

1. Introduction

The feral pigeon, the descendant of the domesticated form of the wild living Rock Dove (*Columba livia*), is a highly successful urbanophilic species, which occurs worldwide. With a domestication history of several thousand years [1], feral pigeons are well adapted to human environments. Due to the abundant feeding options in our cities, feral pigeons have expanded their originally granivorous diet to an omnivorous one [2]. In addition to the positive nutritional effects, cities with house facades, churches and statues offer an ideal environment for the birds. Pigeons that originally lived along coasts with cliffs now use numerous structures associated with urban buildings as roosting, resting, nesting and outlook spots. The close association of large feral pigeon populations and humans creates a human-wildlife conflict with serious health risks. With more than 100 human pathogenic microorganisms and 18 ectoparasites associated with feral pigeons [3,4], the epidemiological significance of these birds to humans is evident. Although the risk of zoonotic diseases caused by feral pigeons is rare, fatal cases have been reported [5]. Besides the medical risk, feral pigeons living in urban habitats also lead to high economic loss due to significant damage to buildings, historic monuments, statues and even vegetation [2]. The removal of pigeon droppings from buildings causes high costs [6]. With an individual pigeon producing around 4–11 kg of excrement each year [7], enormous quantities of pigeon droppings end up in every larger city of the world. This excrement offers a substrate for the growth of microorganisms that are able to destroy building materials [8].

In addition to these negative esthetic and hygienic aspects, the costs of feral pigeons living in urban environments are high. The estimated damages per feral pigeon per year including pollution of buildings, streets and places, as well as hygienic costs, agricultural costs and bird strikes range from 23.7€ to 33.5€ [9], which equals approximately \$US 31 to 44. In the USA, the damage caused by feral pigeons has been estimated to \$US 1.1 billion per year, not including environmental damage associated with the pigeons serving as reservoirs and vectors for diseases [10]. The relevance of pigeons is further pointed out by the number of about 22'500'000 hits when entering the words “pigeon problems” into the internet search engine Google (accessed 28 October 2013).

Frequently recommended solutions to solve the pigeon problems in residential areas and city centers include a large number of nonlethal systems that repel and exclude the birds from buildings and monuments. Repellents can be used to manipulate animal behavior in a way that an animal is motivated to avoid the consequences of the aversive signal [11]. In general, animal repellent systems can be of visual, acoustic, tactile, olfactory, or gustatory nature, or even combine several of these characteristics [11–17]. The business of production and installation of avian repellent systems involves the sales of millions of dollars worth of products in Europe and the USA [9,18,19]. While netting and other exclusion systems are successfully used against pigeons, these methods do not always seem to be an economic or practical option [20], and such eye-catching systems often distract from the

architectural impression [21]. In particular, historic buildings are sensitive to pigeon droppings and difficult to protect from these birds. With the sheltered niches, crevices and ledges common to ornamental facades, such buildings offer ideal nesting and roosting habitats [22]. Several other proofing products promise an optimal integration in the esthetic impression of building facades since they are inconspicuously and discretely mounted onto the affected structure or area. Whereas for example netting and spikes repel the pigeons on the basis of exclusion via mechanical barriers, other innovative systems are often supposed to work with aversive cues that motivate the bird to avoid the treated spaces. These new systems, which are regularly introduced onto the market, promise to be the ideal solution to the problems caused by pigeons on buildings. They are supposed to be not only effective, but also inconspicuous, easy to mount and available at a competitive price. However, data to support the expected results of these new, inventive and allegedly persistently effective bird repellents is rare or inexistent. Furthermore, these new products have rarely been put to test under the point of view of animal welfare. Given the fact that highly motivated pigeons are able to overcome almost every system [19], the effectiveness of new bird repellent products should be investigated critically.

A reasonable feral pigeon management in urban areas requires very good knowledge of proofing and scaring systems and the reactions of the birds towards them. We therefore tested two nonlethal, food-grade, avian repellent gels that are supposed to combine an easy and discrete installation with 100% success in removing the birds from treated areas within less than a week. While one gel is based on the alleged tactile aversion of the birds to capsaicin, the other claims to function through a visual repellent effect that is reinforced by ingredients that are repulsive to the olfactory, gustatory and tactile senses of the birds.

The objective of our study was to assess the effectiveness of these two avian gel repellents by analyzing the behavior of feral pigeons when confronted with them. In addition to the efficacy of the products, we also focused on the gels from the point of view of animal welfare.

2. Materials and Methods

2.1. Study Area

We conducted our study in the pigeon loft of the St. Matthew Church, which is situated in a residential district of Basel, Switzerland (47.5671°N, 7.5930°E). The city of Basel is located in northwestern Switzerland, at the intersection of Switzerland, Germany and France. In August 2012 it counted around 170'000 inhabitants. The climate is continental and during the study period, average temperatures ranged from 20.7 °C in August to 10.7 °C in October.

The pigeon loft was situated above the nave of the church at a height of about 18 m above ground. Besides a floor space of 28 m², the loft had 39 nesting boxes and several roosting bars. We set a timer for constant diurnal rhythm of 9 hours and 30 minutes of light and 14 hours and 30 minutes of dark in the loft. The experiments were performed under natural conditions without offering any food or water. The pigeons used the loft exclusively for roosting and breeding. Their food was generally foraged in the surrounding area and the city [23].

2.2. Tested Bird Repellent Gels

Two avian repellent gels were tested on free-ranging feral pigeons: a contact gel and an optical gel. Both products are used in pest bird management programs to protect structures from birds. Since repellent products are continuously changing their names or reentering the market only slightly modified, we refrain from providing the names of the products and the manufacturers. Instead, the tested products stand for a specific but conventionally used kind of repellent system.

2.2.1. Contact Gel

As specified by the manufacturer, the contact gel included non-toxic, 100% natural ingredients and can be used to protect all kinds of indoor and outdoor surfaces of buildings, monuments and also statues against nuisance birds, especially pigeons. The gel contained 0.0357% capsaicin, which is the pungent element of red pepper [24]. According to the distributor, capsaicin causes a mild harmless irritation when being transferred onto the feet of the birds by landing on the treated areas. This sensory reaction to the gel is supposed to condition the pigeons to avoid the location. The clear, odorless and semi-solid gel was supplied in 300 mL cartridges and applied on the experimental shelves in a wave pattern at a stretch according to the application instructions. The distributor claimed that 100% of the bird population would be successfully removed within seven days of gel application, which was allegedly proven during rigorous testing carried out by the developers.

2.2.2. Optical Gel

The second bird repellent, which was examined, was an optical gel, sold by another distributor. According to the general product information, the gel is patented and contains food-grade natural oils. It is supposed to repel all birds from all indoor and outdoor structures without causing any harm to target animals. Ingredients in the product include polyisobutylene, grease lubrication, peppermint oil and cinnamon oil. According to the distributor, the gel is able to repel the pigeons visually because it is perceived as fire within the ultraviolet visual range of the birds. Furthermore, the distributor claimed that natural oils, which should be abhorrent to a bird's senses of smell, taste and touch, reinforce the visual repellent effect. The gel was delivered in 250 mL cartridges with supplementary application dishes of 7 cm in diameter. We applied 15 g of the repellent gel in each dish as recommended in the manufacturer's guidelines.

After consultation with the distributor who determined the number and location of dishes on the experimental shelves, we arranged eight dishes per shelf in two parallel rows of four dishes. The dishes covered a total of 17% of the shelves. The greatest distance between two dishes was 13 cm. According to the application guide, this distance referred to an area with high bird density. The manufacturer claimed that after two or three days even the most dominant birds would avoid the treated areas.

2.3. Study Animals

The feral pigeon colony used for this study contained about 85 birds with an average body weight of 322 g. Due to the fact that the pigeon loft was freely accessible to every feral pigeon in the surrounding area and the birds of our study were able to enter and leave the loft at will, fluctuation of

the population was possible. We routinely caught, ringed and weighed the resident pigeons every six months. During the study period, one pigeon that hatched in the loft became integrated into the population, another adult pigeon immigrated and six pigeons, both adults and young, left the population. Due to the periodical flock controls and the cleaning of the pigeon loft twice a month, the pigeons were habituated to human presence. Even though all pigeons of the loft were ringed, either directly as nestlings or as immigrated adults, the small ring numbers were not recognizable on the video material. An unambiguous assignment of the observed reactions of the pigeons to a particular bird was thus not performed.

2.4. Experimental Design and Data Collection

We installed four experimental shelves of 0.6 m length and 0.3 m width as resting, roosting and outlook spots for the pigeons in the loft. Each shelf was attached onto the wall at right angles, offering the birds a convenient area to perch. The shelves were placed in a zigzag pattern at heights of 0.8 m to 1.6 m, about 1.3 m away from the nesting boxes on the adjacent wall. After the installation, the pigeons were given ten days to get used to the new structures in the loft. We performed our experiment in August–October 2012. It consisted of two main phases: a pretrial of 16 days and a trial phase of 26 days. We monitored the experiment with a video camera (JVC model GY-HM150E, Yokohama, Japan) at random dates each for 24 hours. On 27 August 2012, we started the pretrial phase during which we video recorded three out of 16 days in a weekly rhythm to get a base value for the daily use of the shelves without the installed repellents. The dishes in which the optical gel was applied were not mounted during the pretrial phase. The idea was to first create a natural scene with an ordinary structure frequently used by pigeons and not treated with any kind of repellent or uncommon system. Each of the gels was applied on two of the experimental surfaces, according to the distributor's guidelines, on 12 September 2012. However, the shelves and the wall on to which they were installed were thoroughly cleaned before application, as the products are said to only have full effectiveness when used on unsoiled structures, free from any bird excreta. We recorded 16 days of our 26 days trial phase, with the last recorded day being trial day 26. Due to methodological considerations, we eliminated the first trial day of the visual gel testing and restarted the experiment on the second day of recording. As a result, we excluded the first trial day from statistical analyses and assigned the actual second trial day as the first. Thus, the last recorded day of the visual gel testing was trial day 25.

In addition, the emissions and the lifetime of the excited states of the optical gel was measured as it is supposed to be perceived as fire within the ultraviolet visual range of the feral pigeons. The measurements were taken with the compact fluorescence lifetime spectrometer Quantaaurus-Tau C11367-11 by Hamamatsu excited at a wavelength of 280 nm.

2.5. Animal Welfare Point of View

We conducted the experiments with the animal experimental permission of the Cantonal Veterinary Office of Basel-Town, Switzerland (authorization No. 2296). The study conformed to Swiss law on animal welfare. The permission allows experiments on animals causing mild stress, which corresponds to the severity Grade 1. According to Swiss animal welfare, severity Grade 1 studies include interventions and manipulations on animals for experimental purposes, which subject the animals to a

brief episode of mild stress (pain or injury). Furthermore, it is claimed in Article 4(2) of the Swiss Animal Welfare Act that no person may, without justification, inflict pain, suffering, or injury upon an animal or cause it fear, or disregard the dignity of the animal in any other way. With this in mind, we first tested the pigeons' behavior towards the gels applied in nesting boxes during a test run. During this test run, the pigeons entered their nesting boxes in all cases. Apparently, the birds were not repelled by the gels due to their high motivation to repossess their breeding places. Furthermore, because the chances of nestlings and inexperienced juvenile birds getting into contact with the sticky gels were too high, the nesting boxes test run was canceled prematurely. For that reason we chose to test the repellent gels on new, rather unpopular, experimental shelves in heights starting at 0.8 m so that nestlings and badly flying juveniles were not able to smear the sticky products into their not yet fully grown plumage. With these low motivation structures, not being as fiercely contested as other areas in the loft, the risk of gluing of plumage of adult pigeons was further minimized.

2.6. Data Analysis

We evaluated the recorded behavior and analyzed the number of approaches and landings, as well as the time spent on the experimental shelves prepared with the two repellents for each recorded day. A successful repellent system reduces the number of birds using the protected structure by 100%. Although a general reduction might seem effective to non-experts, only a complete protection marks a successful repellent system. Even low numbers of pigeons still using and soiling the treated areas point out the failure of the repellent system. For the simple reason that even a single pigeon is able to transmit human pathogenic diseases, a repellent system should not only reduce the number of pigeons using a treated structure, but completely remove the birds from it. Due to this reason, the success of the repellents was determined as a reduction of feral pigeons' use of the experimental shelves by not less than 100%.

Based on the claim of the contact gel distributor, complete avoidance of the prepared shelves was to be expected within seven days of gel application. We therefore categorized three trial phases: pretrial (three recorded days), trial Days 1–7 (five recorded days) when full effectiveness was not yet expected and trial Days 8–26 (11 recorded days) when complete effectiveness was anticipated.

For the visual gel we similarly analyzed the number of approaches and landings, together with the time spent on the shelves. The distributor of the visual gel claimed that the product would be absolutely effective within three days of product application. We characterized three trial phases: pretrial (three recorded days), trial Days 1–3 (two recorded days) and trial Days 4–25 (13 recorded days). Additionally, we distinguished between different behaviors of the pigeon towards the visual repellent: (a) approach without landing and therefore no possible contact, (b) landing with immediate gel contact, (c) subsequent gel contact, and (d) no contact with the gel. We combined the data from the two shelves with the same repellent due to the vicinity of the shelves.

The statistical tests were carried out with the open source statistical package R (R Version 2.15.1 and for the residual analyses R Version 3.0.1 for Mac).

The number of approaches per day for both gels was analyzed using a Quasi-Poisson model (function `glm`) with phase (three levels as described above) as the sole explanatory factor. Quasi-Poisson was used to account for overdispersion of the data. To model the time spent on the shelves per landing

for each gel, we used a linear mixed model (function lmer) with the log-transformed time spent on the shelves as the outcome variable, phase as fixed factor and day as random factor. As uncertainty intervals we calculated Bayesian 95% credible intervals based on 5,000 simulations from the posterior distribution for both number of approaches and time spent on the shelves. Residual analyses included visual inspection of residual versus fitted values plots, quantile-quantile plots for both random effects and fixed effects residuals, as well as temporal autocorrelation plots. These plots indicated no serious violation of model assumptions and no substantial autocorrelation. We use the term “significant” for a fixed effect when the fitted value of one level is not included in the 95% credible interval of the other level.

Moreover, except for the approach without landing, we subdivided the possible behaviors relating to the contact of the landing pigeon with the visual gel (immediate contact, subsequent contact or no contact) into two time based categories: time spent on the experimental shelf ≤ 3 seconds, or >3 seconds. As pigeons have short reaction times of less than half a second, even in multi-option experiments [25], the 3 seconds that were set as the time to react to the repellents were generously determined and in favor of the effectiveness of the gels. Due to the fact that the complete repellent effect of the visual gel is supposed to have developed two or three days after gel application, we only included trial Days 4–25 in the evaluation of the affected senses. The distributor stated that the optical gel would influence the behavior of the pigeons by affecting not only the visual sense of the birds, but also the senses of smell, touch and taste. We therefore categorized the behaviors of the pigeons into seven classes to determine the affected sense in case of a positive repellent effect. We set the distant visual sense as being influenced when a pigeon approached the shelves but did not land on them. Stimulus of the near visual sense was given if the pigeon left within ≤ 3 seconds after it had landed on the experimental shelf and showed immediate or no contact with the gel. We defined no visual repellent effect if the pigeon landed first and had subsequent contact with the gel. For the olfactory sense we also set 3 seconds as the time between contact and flying away as the limit for a successful repellent effect, except for the subsequent contact category. Here we defined the inefficacy of the olfactory repellent effect if a pigeon landed on the shelf first and stepped into the gel afterwards. We defined a failure of the system in a tactile sense if the pigeon stood for >3 seconds in the gel. Due to the rare occurrence of events in these categories, a statistical analysis of these data was not appropriate but results were compiled in Table 1.

In terms of the animal welfare point of view we observed the consequences of the pigeons having direct contact with the gels. In addition, the effect of the gel remains transferred to other structures in the loft, and possibly also outside the loft, was described with the potential consequences for other birds.

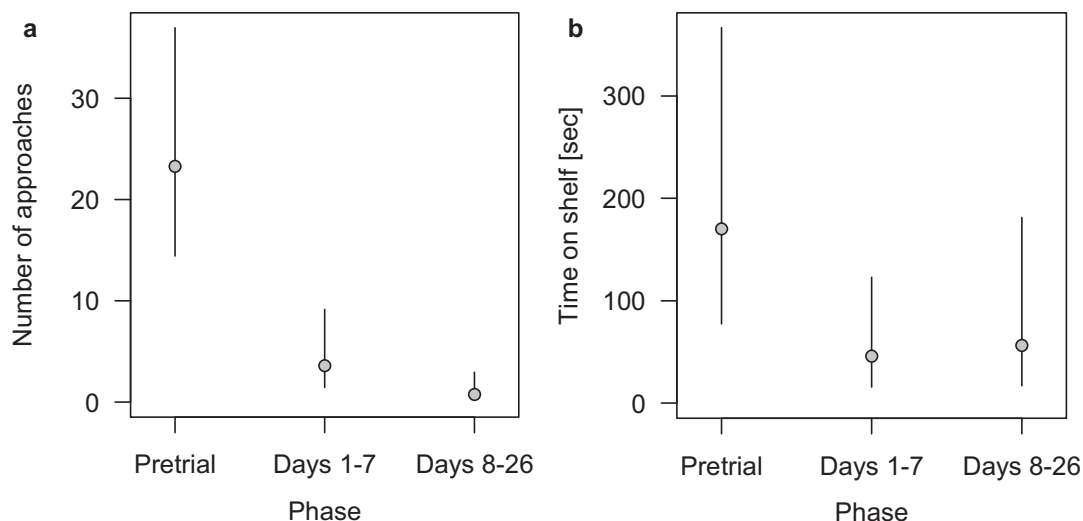
3. Results

3.1. Contact Gel

Figure 1(a,b) shows the results of the contact gel experiment. The numbers of pigeon approaches to the shelves differed by phases. The highest number occurred to the shelves without repellent gel during the pretrial phase (70 approaches). We noted less approaches throughout trial Days 1–7 (18 approaches) and the least during trial Days 8–26 (eight approaches). During the pretrial phase, a mean of 23.3

approaches per day (14.4–37.0 Bayesian 95% credible interval), during trial Days 1–7 a mean of 3.6 (1.4–9.2) and during trial Days 8–26 a mean of 0.75 (0.18–2.95) approaches per day were recorded. The time spent on the experimental shelves during pretrial phase was significantly (or near significantly) longer than during both of the trial phases, but no significant difference occurred between trial Days 1–7 and 8–26 (Figure 1b). During the pretrial phase, the pigeons spent a mean time of 170 (77–367) seconds per landing on the shelf. Trial Days 1–7 showed a mean of 46 (16–123) seconds and trial Days 8–26 a mean of 56 (17–181) seconds per landing. Moreover, we observed only one approach during the pretrial phase that did not lead to a final landing. At this occasion the pigeon flew in the direction of an experimental shelf but turned away shortly before reaching it. In contrast, during trial phase all approaches led to a landing.

Figure 1. Feral pigeons' (a) mean number of approaches per day and (b) mean time spent on the shelf in seconds per approach for the three phases pretrial, Days 1–7 and Days 8–26 of the contact gel experiment in Basel, Switzerland, during August–October 2012. Values are means and the segments indicate Bayesian 95% credible intervals. For the mean number of approaches, with n per phase being 3, 5 and 11 recorded days, respectively, a Quasi-Poisson model was used. For the mean time spent on the shelf a mixed model with the log-transformed time on the shelf as the outcome variable (results back transformed for the graph) phase as fixed factor, and day as random factor was used with n per phase being 70, 18 and 8, respectively.

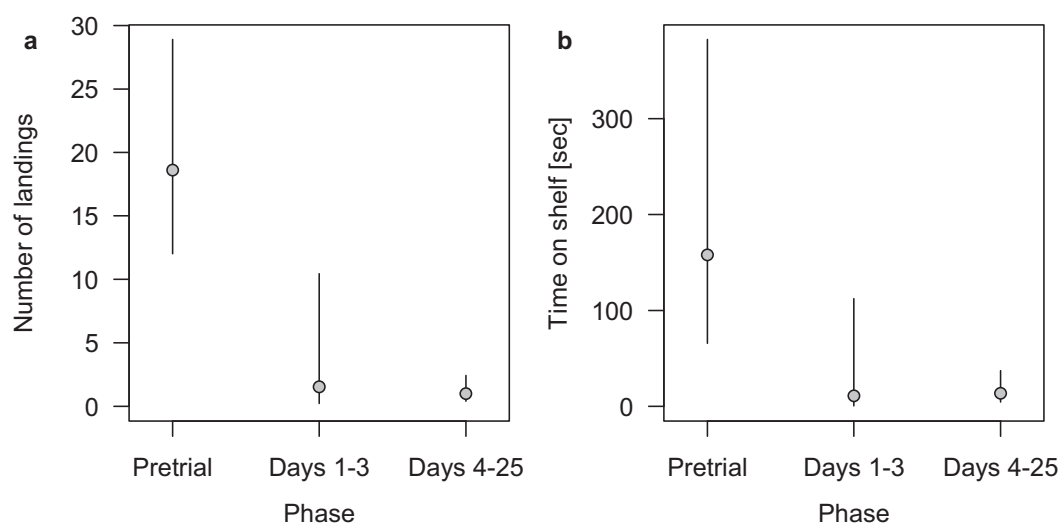


3.2. Optical Gel

During the optical gel repellent test we observed that all approaches to the experimental setup were finished with a landing. We observed a total of 56 landings during the pretrial phase. For trial Days 1–3 we monitored a total of three landings and for trial Days 4–25 a total of 13 landings. The trial phase showed a significant decrease in landings per day compared to the pretrial phase (Figure 2a). During the pretrial phase we detected a mean of 18.6 (12.0–28.9) landings per day, during trial Days 1–3 a mean of 1.53 (0.23–10.45), and during trial Days 4–25 a mean of 1.01 (0.40–2.44). We recorded no difference between trial Days 1–3 and 4–25.

Figure 2b shows that during the pretrial phase, when the shelves were not prepared with the optical gel, the pigeons spent significantly more time on the shelves per pigeon landing than during the trial phases. We observed a mean time spent on the shelves per landing of 158 (66–383) seconds during the pretrial phase, a mean of 11 (0.4–112) seconds for trial Days 1–3 and a mean of 14 (4.5–37) seconds for trial Days 4–25. There was no significant difference between the two trial phases.

Figure 2. Feral pigeons' (a) mean number of landings per day and (b) mean time spent on the shelf in seconds per landing for the three phases pretrial, Days 1–3 and Days 4–25 of the optical gel experiment in Basel, Switzerland, during August–October 2012. Values are means and the segments indicate Bayesian 95% credible intervals. For the mean number of landings, with n per phase being 3, 2 and 13 recorded days, respectively, a Quasi-Poisson model was used. For the mean time spent on the shelf, a mixed model with the log-transformed time on the shelf as the outcome variable (results back transformed for the graph), phase as fixed factor, and day as random factor was used with n per phase being 56, 3 and 13, respectively.



We summarized the behaviors of the pigeons to the optical gel during trial days 4–25 into seven categories to analyze which sense could have been influenced by the aversive signal (Table 1). All observed 13 approaches led to a landing and all of the stays on the protected shelves lasted >3 seconds.

Table 1. Number of behavioral responses of feral pigeons to the tested optical gel on trial Days 4–25 with determination of the senses appealed to in Basel, Switzerland, during August–October 2012. *f*, far; *p*, possible.

Behavioral response	<i>n</i>	Appealed senses
Approach without landing	0	Visual (<i>f</i>)
Landing, immediate contact, ≤3 sec	0	Visual, tactile, olfactory
Landing, immediate contact, >3 sec	7	No visual, no tactile, no olfactory
Landing, subsequent contact, ≤3sec	0	No visual, tactile (<i>p</i>), no olfactory
Landing, subsequent contact, >3 sec	4	No visual, no tactile, no olfactory,
Landing, no contact, ≤3 sec	0	Visual, olfactory
Landing, no contact, >3 sec	2	No visual, no olfactory

When testing the emission of the optical gel, a maximum at 357 nm was found. This demonstrates that the product did emit in the ultraviolet light range, which covers wavelengths of 100 nm until 380 nm.

As to the animal welfare point of view we could observe several pigeons stepping into the gels, either directly when landing onto the experimental shelves or subsequently after landing next to the shelves. Already after a short period of time, both gels looked rather unesthetic and messy due to a variety of insects, feathers and dirt that become stuck in the repellents either directly or in the remains on the shelves (Figure 3).

Figure 3. Appearance of the tactile gel (a) and the optical gel (b) after 23 days of application. Due to the adhesive effect numerous insects, feathers, dust and feces became stuck in the gels. The gluey optical gel got stuck on the wall underneath the experimental shelf when the pigeons stepped into the repellent and flew off pulling long adhesive strings. These remains were extremely difficult to remove.



While the tactile gel is rather harmless to pigeons regarding its stickiness, the optical gel is of extremely adhesive texture. Here, the possibility of gluing of plumage is definitely given. In addition, it was observed that birds transferred the gels, especially the optical one, to numerous other structures into the loft. Due to the extremely gluey structure of the optical gel, the birds pulled long strings when they stepped into the gel and flew off (Figure 3b). These strings got stuck not only to the experimental shelves, but also to the walls, the ground and were transferred to divers other areas in the loft, as for example the nesting boxes. We can not ensure that the gel was being transferred to other areas outside the loft, but this option seems likely when looking at the numerous traces of gel being spread all over the loft. When cleaning the loft, it was extremely difficult to entirely remove the gel remains. Even strong cleaning agents were used, but some adhesive residues could not be completely removed.

4. Discussion

Both gels showed a restricted repellent effect by reducing the number of approaches of feral pigeons and their time spent on the experimental shelves per landing, but the claimed complete effectiveness, meaning a reduction of the number of birds using the protected structures by 100%, was not observed.

4.1. Contact Gel

The number of approaches during the contact gel experiment decreased constantly over the trial phases. The time spent on the shelves decreased initially, but increased again slightly during trial Days 8–26. We suspect this could be due to initiating habituation. The chance of new birds entering the loft was very low. Techniques such as tactile repellents are recognized to be of limited use because the learned avoidance of the unpleasant sensation extinguishes rapidly [11]. The repellent mechanism of the product tested is supposedly based on a slight irritation of the birds by means of capsaicin, the pungent element of red pepper. While capsaicin is an extremely effective irritant for mammals, birds are almost totally insensitive to it [13,15,16,26,27]. For this reason, a claimed sensory reaction to the gel, as stated by the distributor, is not expected. Instead, we attribute the observed repellent effect as a result of neophobia and discomfort. No complete avoidance of the experimental shelves was observed after a week of gel application. The pigeons rather appeared to get used to the new substance. They often flew onto the treated surface and stood in the repellent, which led to a constant removal of the gel (Figure 3a). Due to this contact with the gel, feces, dirt and feathers were regularly transferred onto the experimental shelves, masking any tactile effect. In addition, numerous insects also became stuck in the gel. Even though the sticky effect of the tactile repellent did not appear to be dangerous for the pigeons, any adhesive effect would make the gluing of plumage possible [12] and therefore contradicts animal welfare. When the birds preen themselves, they possibly disperse the gel even further over and into their plumage. The gel can also be transferred onto other structures and potentially affect non-target, perchance even protected, species.

A repellent effect was detected, but a complete effectiveness of the gel, which is necessary in feral pigeon proofing, is missing. Additionally, the gel has an unpleasant esthetic aspect and a limited life span due to fouling with dust, insects, feathers and feces. Furthermore, the possibility of gluing of plumage and of affecting other structures and non-target birds is given. Due to these reasons, we cannot recommend the tested tactile gel repellent.

4.2. Optical Gel

The optical gel repellent led to a decrease in landings over the trial phases. The time spent on the experimental shelves per landing was initially reduced but then increased again slightly during trial Days 4–25. The gel failed to achieve complete effectiveness since the pigeons still flew onto the treated surfaces after more than 3 days of gel application. According to the distributor, the product tested is able to repel birds visually because it is perceived as fire in their ultraviolet visual spectrum. In addition, the distributor claimed a reinforced repellent effect caused by natural oils that should be abhorrent on an olfactory, gustatory and tactile basis. Even though the effectiveness of certain repellents can be improved by additional sensory cues [28], this gel did not achieve complete avoidance of the perch area after three days of application and thus failed to prove the essential full effectiveness. According to the distributor's statement, the gel is seen as fire by the birds. Despite the fact that pigeons are certainly sensitive to ultraviolet light [29] and therefore could possibly perceive the gel as fire, one wonders how a pigeon should be familiar with fire and associate it with danger given the lack of experience. An inborn avoidance of ultraviolet light and fire lacks any evidence. The emission measurement of the optical gel showed that the gel did emit in the ultraviolet light range. However, only flames at temperatures hotter than 2,500 °C contain ultraviolet parts of the light spectrum. A normal fire by contrast does not contain ultraviolet light [30]. The reasoning of the birds seeing the optical gel as fire could therefore not be reconstructed. In addition, the effect of an outdoor use of the gel in the dark, as well as an indoor use without a supplementary artificial light source, remains questionable. According to our tests, it is not possible that the optical gel owns a repellent effect due to ultraviolet light emission. We suggest instead that the observed change in landings and time spent on the experimental shelves is due to other factors.

Furthermore, we observed a unique event during which a pigeon landed directly into one of the dishes and pecked into the gel repellent after about two seconds. This was repeated twice 13 seconds later. This observation suggests that the gel has no negative effect on the gustatory sense of a pigeon. In addition, all of the 13 approaches led to a landing and the pigeons stood longer than three seconds on the protected shelves or even directly in the gel. This further suggests that the gel does not work on the above-mentioned senses of pigeons.

5. Conclusions

Overall, we conclude that both gels showed a repellent effect, but failed to display the complete effectiveness that is unquestionably essential for a successful feral pigeon management. Our results indicate that capsaicin is ineffective in feral pigeon repellent systems. This is consistent with several other studies and the fact that pigeons are not irritated by capsaicin due to their lack of capsaicin-receptors [13,15,16,26,27]. The primarily observed repulsive effect of both gels is presumably due to neophobia, discomfort and the reduction of space on the shelves. For our second trial phase, we observed a slight, yet statistically not significant, increase in the time spent on the shelves per landing for both gels. Such a fading effect of the repellent is most likely to occur if this effect is based on startle responses due to neophobia. If the relevant stimuli are presented more than a few times, the animals desired to be repelled get accustomed to them [13,31].

As previously shown [19], young and inexperienced birds in particular landed repeatedly on the protected structures. Thus a test run was cancelled prematurely because the chance of nestlings getting directly into contact with the gels was too high. Especially the optical gel had an extreme adhesive effect, which could possibly lead to severe gluing of plumage of any bird as it already occurred with other so-called safe bird repellents [32]. Even weeks after the end of the study, we detected sticky remains of the repellents in the loft. This would definitely leave negative esthetic residues on surfaces if applied onto building facades, possibly causing even more damage than the pigeon droppings themselves. Given the possibility of young birds and also non-target birds coming into contact with the adhesive gels and the fact that any stickiness, even if relatively harmless, contradicts animal welfare, we can not approve the gels.

In our experimental situation, the treated shelves were not particularly attractive to the birds because the pigeon loft offered enough room where the repellents could be avoided. The fact that the pigeons still landed on the treated surfaces shows that even pigeons with low motivation can easily surmount the tested repellents. Summarizing, both gels seem to have only an ineffective, non-permanent repellent effect. Nevertheless, only repellents reducing the number of birds using the treated structures by 100% are effective systems. Therefore the tested products are not recommendable for a successful feral pigeon management.

Systems based on exclusion and mechanical barriers still remain the most reliable repellents. However, the best way of efficiently coping with the pigeon problem in our cities seems to be the reduction of the pigeon population, and this can only be achieved by reducing the food supply of the birds [2].

Acknowledgments

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Conflicts of Interest

The authors declare no conflict of interest.

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From: [Joshua Cairns](#)
To: [DNV Input](#)
Subject: FW: Form submission from: Keeping pigeons
Date: April 16, 2021 11:59:55 AM

Forwarded for the record for upcoming Public Meeting on Bylaw 8470 (Monday April 19, 2021).

-----Original Message-----

From: infoweb@dnv.org <infoweb@dnv.org>
Sent: April 15, 2021 5:26 PM
To: Joshua Cairns <CairnsJ@dnv.org>
Subject: Form submission from: Keeping pigeons

Submitted on Thursday, April 15, 2021 - 17:26 Submitted by anonymous user: 99.199.112.165 Submitted values are:

Your name: William Watt

Your email address: [REDACTED]

Do you have comments on this proposed bylaw? Concern is Disease. Proper keeping of Pigeons recommend that any new birds introduced to a Loft, be quarantined for a minimum of 2-4 weeks. This implies that Pigeons can carry diseases that can have a negative affect. How can we logically monitor those who are keepers of Pigeons. We are currently having to live with a Pandemic that appears to have originated with animals, then passed to humans. Why risk the health of the neighbours who live nearby a Pigeon keeper's property.

Think we should again, prohibit the keeping of Pigeons, and if we must, Grandfather those handful of those who own and keep Pigeons currently. I would prefer my tax dollars not go to having to police this hobby. It would be a burden on our Bylaw enforcement department.

The results of this submission may be viewed at:
<https://www.dnv.org/node/2975/submission/92293>

From: [Victoria Van Weert](#) on behalf of [Community Planning](#)
To: [Joshua Cairns](#); [Carol Walker](#)
Cc: [DNV Input](#)
Subject: FW: Pigeon bylaw
Date: April 19, 2021 12:20:16 PM

FYI

From: [REDACTED]
Sent: April 18, 2021 3:08 PM
To: Community Planning <communityplanning@dnv.org>
Subject: Pigeon bylaw

Good afternoon District of North Vancouver Council:

Thank you for inviting comment on the proposed new bylaw 8470, 2021, regarding the keeping of pigeons on private property.

I wish to state my support for proposed bylaw 8470 which takes into account the health of the limited number (20) of pigeons any private individual would be allowed to keep on his/her property as well as the requirement to have a permit to keep said pigeons. However, I think this new bylaw should only apply to current pigeons owners as a grandfathering-in measure to avoid current pigeons owners having to sell or kill off the flocks they currently have. I believe future ownership of new flocks of pigeons should not be permitted. This is because I feel restricting the movement of winged animals is cruel, while releasing such semi-domestic birds as pigeons into the environment for exercise could pose a risk to native or migratory birds.

Thank you again for inviting public input on the proposed new bylaw, 8470. I intend viewing the meeting tomorrow evening but prefer to not comment verbally.

Sincerely,
Ros.
Rosalind Britten

[REDACTED]
[REDACTED]