Bat rabies, what is the risk?

Knowledge, attitude and perception of bat rabies among bat workers and animal ambulance employees in The Netherlands.

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Bat rabies in The Netherlands

Europe: 5 deaths due to bat rabies since 1977. The NL: low risk country.

Two types of bats are reservoir for European Bat Lyssa Virus (EBLV) 1 and 2 in the Netherlands (see photos):

- **Serotine bat** (*Eptesicus serotinus*)
  - Most important EBVL1 carrier.
  - Fairly large bat, large ears, wingspan of ~37 cm.
  - Of those tested 21% EBVL+
  - Population in Netherlands 30-50.000 bats
- **Pond bat** (*Myotis dasycneme*)
  - Medium sized, wingspan 20-30cm
  - Of those tested, 0.01% EBVL+

Risk bat rabies for population

- Very small (but realistic) risk for the general population.
- Higher risk for those with occupational or hobby exposure to bats (bat workers and animal ambulance employees; also lab workers, vets)

Rabies protection

- *Pre-exposure*: vaccination, routine measurement antibody titre, use of gloves while handling bats.
- *Post-exposure*: thorough and correct washing of the wound, post-exposure immunisation and vaccination.

Currently not clear for public health authorities: how many people get bitten, level of pre- and post-exposure protection, actions upon a bite.

Objective

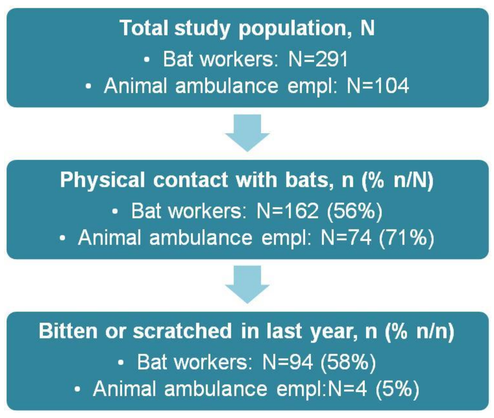
Describe / quantify among Dutch bat workers & animal ambulance employees:

- Risks: e.g. the frequency of bat incidents (bites or scratches)
- Behaviour: e.g. the use of pre-exposure and post-exposure protection
- Knowledge of bat rabies risk

→ Formulate recommendations to public health authorities and high risk exposure groups on improvement of pre- and post exposure protective measures for bat rabies in the Netherlands.

Methods

- *Cross sectional observational study* among bat workers and animal ambulance employees in the Netherlands in 2012.
- *Data collection* with (online) questionnaire about:
  - General (type of bat work, demographic information)
  - Knowledge ('Which bats can have EBVL', 'Risk of rabies after a bite')
  - Frequency of bat contact, frequency and type of bites/scratches
  - Protective behaviour: pre-exposure (vaccination, gloves), post-exposure (washing wound, vaccination, contact public health authorities)
  - Reasons for using or not using certain protective measures.
- Descriptive & stati. analysis: identify groups with low protective behaviour



Serotine bat (Eptesicus serotinus).
Photographer: Elena V. Godlevska; RIVM website
http://toolkits.loketgezondleven.nl/toolkits/?page_id=1866

Pond bat (Myotis dasycneme)
Photographer: Elena V. Godlevska; RIVM website
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	Bat workers	Animal ambulance employees
General characteristics (all)	**N=291**	**N=104**
Age > 40 years	61%	74%
% male	68%	28%
Can name at least 1 of 2 bats that can have EBVL in the Netherlands	73%	7%
> 5 years experience with their work	58%	30%
Frequent physical bat contact	56%	71%
Pre-exposure rabies vaccination	64%	7%
With bat contact	**N=162**	**N=74**
Vaccinated	64%	
Biting/scratching incident in last year	58%	5%
With recent incident	**N=94**	**N=4**
Knows type of bat of the incident	90%	0/4
Number of bites in last year	1-60	-
Type II (=skin slightly damaged, no blood)	36%	-
Type III (=transdermal; or on broken skin)	21%	3/4

Results

See Table for overview of the main results.

Bat workers

- 56% of 291 respondents: frequent contact with bats; of whom 58% bitten last year. They have a high rabies knowledge.
- Unvaccinated bat workers with 'bat contact' (n=59) more likely to wear gloves while handling bats (76%) vs. vaccinated (14%; RR 5.6; 95%CI 3.4-9.3)
- Titre measurement policy/guidance not always clear
- Reasons 'Not vaccinating': not working with dangerous bats; financial.
- Reasons 'Not using gloves' (N=51): obstructive when handling bats (85%); most recent Ab-titre measurement 'high enough' (49%); vaccinated (63%)

Animal ambulance employees

- Of the 104 respondents, 23% had received training on rabies risk in bats
- Glove use among those with bat contact 77%.
- Reasons for not vaccinating (pre-exposure) : financial motives (38%); never thought of (25%); will use post-exposure vaccination (34%)
- All with a recent incident had contacted (public) health authorities for advice

Recommendations

- Education of these high exposure groups on rabies risks and prevention
- Clear guidelines on titre measurements and protective titre
- Post exposure:
  - Clear instructions on wound washing (5-10 min with water and soap)
  - Clear and efficient post-exposure care by public health authorities
- Explore possibilities free rabies vaccination for those with frequent bat exposure; paid for by employer, also when volunteering.

Conclusions

Bat workers

- > 50% of those with bat contact are frequently being bitten/scratched
- Highly educated group with good knowledge on rabies risk and 'rabies' bats
- About a third not vaccinated (pre-exposure); mainly financial reasons. However, high glove use among the unvaccinated and *vice versa*.
- Guidance on titre measurements and policy not always clear

Animal ambulance employees

- Less frequently bitten/scratched than bat workers, but can get serious bites
- However, vaccination coverage very low. Little knowledge on 'risky' bats
- Education on protection against bat rabies can be improved.

Overall

- Post exposure wound washing insufficient knowledge on what to do.

Discussion

- First study of its kind in The Netherlands; informative for policy & guidance
- Absolute health risk of bat bites is relatively small; however, the risk is real and optimal protection of those exposed to bats is desirable.
- Potential overrepresentation of bat workers with frequent bat-contact and bites (overestimation frequency of incidents)
- Unknown response rate due to overlapping mailing lists bat workers

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