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# Tick Surveillance, Risk Perception, and Prevention in Bedford, Ma

Massachusetts Department of Public Health:  
Summer 2018 Local Health Internship Program  
Town of Bedford, MA Board of Health  
Site Supervisor: Mark Waksmonski, Community Health Nurse  
HPP 698E- PHE Practicum  
August 12th, 2018

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**Abstract:****Introduction:**

Bedford, MA has seen an increase in the number of tick borne illnesses (TBI's) including, Lyme disease, Babesiosis, and Anaplasmosis among residents. The goal of this study is to assess the risk perception that Bedford residents have regarding ticks and TBI occurrence so that interventions may be considered. Exposure to ticks have increased due to increased reservoir size, increased favorable habitats for ticks, and a densely populated community where human outdoor activities are common. Retrospective data extracted from the Massachusetts Virtual Epidemiologic Network (MAVEN) from July 2008-July 2018 indicates that there were 101 confirmed, 40 probable, and 246 suspected cases of Lyme disease; 20 confirmed, 1 probable, and 1 suspected cases of Babesiosis; and 21 confirmed, 7 probable, and 7 suspected cases of Anaplasmosis among Bedford residents.

**Methods:**

An online survey was created via SurveyMonkey with a link distributed to Bedford residents only, using several media outlets including Bedford Cable TV, The Bedford Minuteman, The Patch, The Bedford Citizen, and a Facebook post on the town's page. Similarly, a link to the survey was generated into a QR code, a barcode that is a machine-readable and provides a direct link to the survey, and was administered to 8 local businesses. Examples of questions covered through the survey included assessing knowledge of tick identification, perception of risk, concern about potential illness, etc.

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**Results:**

From July 6th to July 27th, 2% of town adults responded to the survey. The survey confirmed that residents are spending at least 1-4 hours outdoors each day, participating in mainly leisure activities such as gardening, walking, yard work, etc. Response analysis suggests that respondents would benefit from increased education regarding tick identification, personal prevention methods, and additional signage posted in town in areas where ticks are commonly found.

**Discussion:**

Survey responses provided insight into the perceived risk that residents have regarding tick exposure and TBI occurrence. Respondents indicated a need to be more educated about proper tick identification, etc. and expressed a desire to be notified about higher risk areas in the town. Respondents also indicated a desire to have pesticide application utilized to reduce tick burden in high-density tick areas of Bedford. As a result of the survey findings, consideration will be given to administering pesticides to specific areas where ticks are abundant.

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The public health concern addressed throughout this project covers ticks and associated TBI occurrence within Bedford, MA. At the start of the practicum the main focus was solely geared towards Lyme disease, as I was unaware of the concern with other TBI's that have affected residents of the community. Lyme disease, Babesiosis, and Anaplasmosis were the three common TBI's referenced throughout this research project. Between July 2008 and July 2018 the Massachusetts Virtual Epidemiologic Network (MAVEN) indicates that there were 101 confirmed, 40 probable, and 246 suspected cases of Lyme disease, 20 confirmed, 1 probable, and 1 suspected cases of babesiosis, and 21 confirmed, 7 probable, and 7 suspected cases of Anaplasmosis over the last 10 years among Bedford residents.

Originally the goal of the project was to take this information and find a way to educate the community about awareness and prevention strategies to protect themselves from TBI's, but upon further discussions with my site supervisor, it was recommended that the goal of the project should be to first discover the risk perception that Bedford residents have regarding ticks and TBI's, as this information will help to effectively tailor the intervention methods to residents in the town.

In order to understand the residents risk perception and understanding about a variety of health related issues, which includes ticks and the associated TBI's, a survey through SurveyMonkey was drafted and administered to residents through several social media outlets including, Bedford Cable TV, Bedford Minuteman (Wicked Local), The Patch (online newspaper), Bedford Citizen (online newspaper), and a Facebook post. Additionally, the survey

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was created into a QR, a barcode that is a machine-readable and provides a direct link to the survey, and was administered to 8 local businesses in town including, 2 pet stores, 1 vet office, 1 grocery store, 1 locally owned farm, 1 flower shop, and 1 ice cream shop. Data from the survey is intended to drive policies and enhance support for tick prevention initiatives within the town.

The survey that was administered to residents within the town of Bedford helped to prove just how harmful TBI's are in this town specifically. As I mentioned previously, at the start of the project I was unaware that there are 3 TBI's that are of concern, and not just Lyme disease. The responses received from residents shows that although some residents are familiar with ticks and TBI's, there continues to be a large majority of residents who would benefit from increased education regarding tick identification, personal prevention methods, and additional signage posted in town in areas where ticks are commonly found in order to fully protect themselves from TBI's.

I plan to create a future goal of eradicating the tick concern within the town of Bedford through a separate course I am enrolled in. The course is titled, "Health Promotion Planning," and the work we are conducting includes creating a hypothetical promotion plan for a public health concern, which in this case will be tick and TBI occurrence within the town of Bedford, MA. I have decided to use the needs assessment from this project and elaborate on it by addressing what can, and should be done in the future to control the rising cases of TBI's within Bedford. Currently I am working on creating a plan to have a live news feed on Bedford social media outlets within the town that will provide residents with updated, confidential, new cases of

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TBI's, and whether or not they were confirmed, probable, or suspected. The live news feed will also list the location within Bedford that the person was affected by the tick as well.

Another potential promotion plan is to post additional signage to that of the CDC, only with a more detailed description and pictures of ticks so people know what to look for when enjoying time outdoors in wooded areas where ticks are more commonly found. Lastly, responses from the survey indicated that residents are in favor of pesticide application utilized to reduce tick burden in high-density tick areas of Bedford. As a result of the survey findings, consideration will be given to administering pesticides to specific areas where ticks are abundant. Since 233 (2%) of adults in the town responded to the survey, which ultimately is not enough votes to make a large decision such as this, additional voting will need to be conducted before spraying with pesticides in town.

The approach I made for this project included doing research on the cases of each of the 3 TBI's and using that information to determine whether or not TBI occurrence in Bedford is a significant threat to human health. The methods used to gauge the communities risk perception regarding ticks and TBI occurrence was through the form of a survey. The survey was chosen because it was a good way to receive random feedback from people of all ages, and from people living in all parts of Bedford. I figured if we had done the survey in person, by choosing a specific location to stand with a table, paper surveys and pencils, then the responses could have been bias.

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I would not have done things differently, only because the main point I wanted to target was establishing the communities risk perception and I believe I accomplished that through administering the survey and gaining useful feedback from residents in the community. If I had more time I could have received even more feedback, which would have made the responses even more significant, but other than that I feel like what I was trying to accomplish was successful in the end.

As a result of the work I put into the tick awareness and TBI prevention project I was able to gain an understanding of the communities risk perception regarding ticks and associated TBI's. The Bedford Board of Health is now able to gear intervention methods towards what is known to be needed by residents in the community. Survey responses provided insight into the perceived risk that residents have regarding tick exposure and TBI occurrence. Respondents indicated a need to be more educated about proper tick identification, etc. and expressed a desire to be notified about higher risk areas in the town. Respondents also indicated a desire to have pesticide application utilized to reduce tick burden in high-density tick areas of Bedford. As a result of the survey findings, consideration will be given to administering pesticides to specific areas where ticks are abundant.

Overall I had an amazing experience as an intern for the Bedford Board of Health. Not only did I get to work on my official project, but I was also able to collaborate with the community including Bedford Police and the Council on Aging to determine the needs of all different people in the community. I felt that I was also being guided and encouraged by my site

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supervisor and I was always being challenged to push further and think deeper about certain topics. I was able to shadow an Infectious Disease Epidemiologist at the Department of Public Health in Jamaica Plain which was interesting and provided me with in depth information as to what they do on a daily basis.

At my practicum site location I was fortunate enough to conduct many high, medium, and low food establishment inspections, as well as many camp, pool, and tobacco signage inspections too. I was also able to take the lead on drafting a letter to businesses in town who store or use hazardous materials, stressing the need to submit a contingency plan to the Board of Health. For this project I compared the contingency plans recorded to the Bedford Board of Health with the Bedford Fire Department's list of flammable chemicals, and was able to see what businesses on the flammable list are not on the Bedford Board of Health list and created a chart to see what businesses the letters need to be sent to.

From the feedback I receive on my last day of the practicum, I would say that my supervisor was proud and appreciative of all the work I engaged in throughout the summer. Along with the assignments I was given throughout this course, as a MDPH intern through the Local Health Internship Program, I was also responsible for submitting a 350 word abstract to be printed and given to all attendees who attend the final poster session for interns on August 15th. During the poster session I will be presenting my project along with 34 other interns in the program. Additionally, I was the only student selected for a stipend opportunity through The



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New England Public Health Training Center (NEPHTC), so for their requirements, I also had to submit all documents and projects I worked on throughout the course of the semester as well.

Throughout the practicum experience the main challenge I faced was trying to decide how I was going to actually gain the communities risk perception regarding ticks and TBI occurrence within the town. I was interested in handing out surveys by paper at local stores and businesses, but after observing the town walking into many local businesses I noticed that most people were in a rush and did not seem like they would have the time to take to fill out a paper form of the survey. We then decided to send out the survey mainly online through several social media outlets and had great success. After a few weeks we also decided to create paper forms of the survey with the link provided and a QR code for people to scan and take the survey online. We discovered that once the paper forms of the survey were administered to businesses in town we did not receive many additional responses to the survey. I am happy that we initially decided to use social media as we were able to target a much larger audience and the feedback received was more diverse. I was surprised that 233 residents responded in less than a month, in fact, most of the responses were received within the first 2 days.

I imagined public health practice would consist of determining a needs assessment, which is what was accomplished through this project. If we did not determine the needs of the community, then time and money could have been wasted on providing interventions that are not needed within the community. I would recommend this practicum experience to anyone who is interested. It was nerve-wracking applying for the MDPH program because they have

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requirements in addition to the practicum course requirements, but the learning experience will far outweigh any challenges. Not only was working as an intern for the MDPH beneficial because of the knowledge gained, but having the opportunity to shadow an Epidemiologist boosted my confidence in being able to conduct work as they do.

Additionally, we were informed that here on out, if interns who participated in the internship program through MDPH apply for a job there, then we will automatically be bumped to the top of the list for an interview just because we have been enrolled in this internship program. Lastly, the MDPH internship program will challenge me to present in front of many professionals of various backgrounds in the public health field, which I look forward to because as an online graduate student, I have not had to present any of my work to others in person. Before this internship experience I was not too sure of where I wanted my career path to lead, but now that I have gone through it I am very much interested in pursuing Epidemiology for food borne illness at the state laboratory office in Jamaica Plain.

In conclusion, the end results of the practicum experience provided me with insight into the harmful effects caused from the black legged deer tick and how TBI's affect people of all ages within the town of Bedford, MA. The survey showed us that people in the community have moderate risk perception towards ticks and what they have the potential to do to human health. I learned that when dealing with the community you do not always have the chance to reach a large group of people when trying to capture information pertaining to risk perception. I learned how to develop a needs assessment, what types of questions to ask, how to determine the type of

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feedback needed, and then how to analyze the data and decide what the community would benefit from in order to protect their health.

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References:

1. Massachusetts Virtual Epidemiologic Network (MAVEN)
2. **Photo:** Unique Mushroom Extract AHCC® Shows Promise For Lyme Disease. (2018, March 26). Retrieved July 27, 2018, from <http://www.castletonspartan.com/web/view.php/73024/Unique-Mushroom-Extract-AHC>  
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