NTCIR-13
MedWeb Annotation Corpus Guideline
Medical Natural Language Processing for Web Document

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1   Classification Process

We deal with the following diseases and symptoms. Note that we call them as "symptom(s)" in this guideline.

Influenza	Cold	Hay Fever	Diarrhea
Headache	Cough	Fever	Runny nose

We classify tweets by determining whether a Twitter user or someone around the user[1] has a symptom[2] at that point in time[3]. We set three standards common to all symptoms in terms of facticity[2], time[3], and location[1]. Based on the criteria, we label **"p" (positive)** if it is determined as a symptom and **"n" (negative)** if it is not determined as a symptom. For simplicity's sake, this guideline shows examples of tweet messages with labels that are formalized as **"(s_i +)"** and **"(s_i -)"** when the symptom s_i is determined as **"p" (positive)** and **"n" (negative)**, respectively.

2　Standards and Exceptions Common to Most Symptoms

2.1 Standards Common to Most Symptoms

Labeling is a practical practice that is necessary for considering the medical importance of information. For example, information that is too old (occurred several weeks ago) and non-severe symptoms (headache due to over-drinking) should be labeled **"n" (negative)**. Therefore, the following three criteria should be followed:

【**Facticity of Symptom**】 First, it needs to be confirmed that a Twitter user or someone is affected with a certain disease or has a symptom. A tweet just including a disease name or symptom as a topic is removed by labeling it as **"n" (negative)**.

【**Time of Symptom**】 Second, past information is considered meaningless from the viewpoint of surveillance. Such information should be labeled **"n" (negative)**. With regard to time and certain diseases, information that is more than 24 hours old may be clinically important. For instance, surveillance of influenza is done on a weekly basis; including information older than 24 hours is then meaningful for influenza surveillance. While determining how long until information is considered "too old" remains ambiguous, a general guide would be that information within 24 hours—such as information of today or yesterday—is regarded as **"p" (positive)**.

【**Location of Symptom**】 It is necessary to specify the information about the position of the affected person. If a Twitter user himself is affected, the information is labeled as **"p" (positive)** since the position of the user is the symptom's place of onset. For cases where the user is not himself affected, the information is regarded as **"p" (positive)** if it is presumably in the vicinity (same prefecture) of the user, and **"n" (negative)** otherwise.

The summary of these guidelines is found in the table below:

Symptom	•Direct expression of symptom •Indirect expression of symptom •If symptom may exist yet denied •Recovery process •Unknown cases •Suspicion of symptom is observed •Symptoms disappear completely •Expression of expectation or process •Unrelated to having a disease •Except for humans •Metaphorical representation: jokes
Time	•Within 24 hours, including today •Yesterday •Recent occurrence •Recurring symptom that still persists •Past symptoms including two or more days ago •Unknown time
Space	•Same region as user •Same region as user – implied •Symptoms in a group •Symptoms of other people in an unspecified area •Symptoms of another person connected in social networks

2.2 Exceptions

There are exceptions to the above principles. For example, there are many remarks about "headache" that do not indicate a disease--such as "excessive drinking." When doing disease surveillance, such statements should be regarded as noise. Moreover, there are various exceptions for each disease. In addition to "excessive drinking," "medication," "pungently flavored food (including irritant)," "spiritual," "motion sickness," "morning," "menstrual pain," etc. should be excluded for "headache." Such exceptions are summarized in the following table.

	Symptom			
	Accept expressions with suspicion *1	Accept just a word of a symptom	Exceptions	
			"p" (positive)	"n" (negative)
Influenza				
Cold	○	○		
Hay fever	○	○		
Diarrhea	○	○	-Overeating -Indigestion -Alcohol drinking -medication -Pungently flavored food	
Headache	○	○		Due to a sense of sight or smell
Cough	○	○	-Alcohol drinking -Pungently flavored food	
Fever	○	○ (only slight fever)	Side-effect of injection	
Runny nose	○		Hay fever	Change in temperature

*1 Expressions with suspicion include "feel," "have possibilities," "likely to," "a warning sign," "bad feeling," etc.

2.3 Facticity of Symptoms

a. Direct Expression of Symptom

Cases where the symptom is expressed directly—including mild symptoms—are considered **"p"** (**positive**).

Well, Belly Pain and diarrhea as usual	(diarrhea +)
It seems I got hay fever this morning and it's very painful	(hay fever +)

b. Indirect Expression of Symptom

A symptom can be labeled **"p"** (**positive**) with indirect expressions of a symptom. For example, a symptom can be indirectly presumed from hospitalization, medication, other symptom complications, etc. As for hay fever and influenza, many people attempt to prevent them in advance. Therefore, we just consider any mention indicating concrete action.

I will have cold medicine and go to bed now	(cold +)
Gotta drink headache medicine and that ramen I don't want to eat	(headache +)
Sometime I listen to my favorite music as a remedy for a headache.	(headache +)
I bought glasses that people say are effective for allergies.	(hay fever+)
Somebody, come up with a prescription medicine that works crazy well on allergies!	(hay fever+, runny nose+)
I wear a mask as a precaution against the flu when I go out.	(influenza −)
Apparently yogurt is a good allergy remedy.	(hay fever −)

c. If Symptom May Exist Yet Denied

If a symptom is mentioned but then also dismissed or denied, this information is regarded as **"p"** (**positive**). For instance, this is because we generally presume that many patients do not have sufficient medical knowledge, which may cause them to easily overlook or dismiss relevant symptoms.

My head hurts, and I might have a cold.. But maybe I'm not sick since I just ate too much	(headache +, cold +)
Is it a period of hinoki? My eyes also itch, so I can't really just say it's a cold I guess	(hay fever +, cold +)
I thought it was allergies, but I got a fever and it turned out to be a cold! I didn't think I would make a mistake like that.	(hay fever+, cold+, fever+, runny nose+)
My doctor mistook my symtoms for allergies.	(hay fever+, cold+, runny nose+)

d. Recovery Process

In the process of recovery, symptoms may be weak but not completely lost. For such cases, it is considered **"p"** (**positive**) if someone or the user is still affected with such mild symptoms during recovery. However, if the symptoms are completely gone, it is considered **"n"** (**negative**).

Kinda gained a headache after recovering from nausea	(headache +)
I went to bed in the heat last weekend. Generally recovered this week, but still runny nose a bit	(fever −, runny nose +)

e. Unknown cases

A symptom is **"p"** (**positive**) even if the user expresses uncertainty regarding its cause.

My head recently hurts… whyyyyy	(headache +)

f. Suspicion of Symptom is Observed

Since it is generally presumed that many patients may overlook symptoms or diseases due to insufficient medical knowledge, even suspicion of symptoms and diseases are recognized and labeled **"p"** (**positive**). Indications of suspicion include the expressions of "similar," "maybe," "possibly," etc.

Is this an omen or a cold?	(cold +)
Ugh, stiff neck. From colds, maybe?	(cold +)

g. Symptoms Disappear Completely

Symptoms that disappeared completely are recognized and labeled **"n" (negative)**. Note that we regarded and labeled **"p" (positive)** when a user took medicine that could cause temporary recovery from a symptom.

I pushed through it and now my congestion is gone.	(runny nose−)
I took medicine and I stopped coughing!	(cough+)
Finally, diarrhea has subsided.	(diarrhea−)
If you get rid of your headache and listlessness, you should have a drink of water and sleep all night! Trust me, I recovered from them!	(headache−)

h. Expression of Expectation or Process

For cases that express expectation or process, indicated with words such as "if," "going," "if it is," etc., these should be labeled as **"n" (negative)**.

My body feels heavy... I suspect I have influenza if I get a cough and fever. Some students got influenza and the school has been shut down.	(fever−)
I hope I'm not gonna get a cold ☹	(cold−)

i. Unrelated to Having a Disease

If the disease is mentioned merely as a topic rather than someone having it, these tweets should be labeled as **"n" (negative)**. These include news, general theories, and advertisements.

It is a sign of cold remission when runny nose begins to solidify.	(runny nose−, cold−)
News: 83 percent of people infected with [pandemic influenza] in Osaka have 38 degree high fever or more http://□□	(influenza−)

j. Except for Human

My puppy is afraid of the cold so I wanna return early and keep her warm.	(cold−)
My computer is inducing the thermal runaway from the morning... In the usual way, the power supply is suddenly shut down due to high temprature.	(fever−)

k. Metaphorical Representation: Jokes

If the disease is mentioned in the context of a joke, these should be labeled as **"n" (negative)**.

Fever!	(fever−)
Cold* is strong like typhoon.	(cold−)

*風 (wind) is written incorrectly as 風邪 (cold).

2.4 Time of Symptoms

Although the occurrence and condition of each symptom is different, it is common to be getting better in the recovery stage. Therefore, we will positively extract symptoms observed within 24 hours or the the day before so that we consider the possibility of remaining slight cases now or having just recovered from them.

The figure shows the process of a symptom. The X-axis indicates time while the Y-axsis indicates the condition of the symptom. Case A and Case B are regarded as **"P" (positive)** since symptoms at least exist within 24 hours and the day before, respectively. As for Case C, we regard as **"N" (neative)** because the symptom is before 24 hours and more.
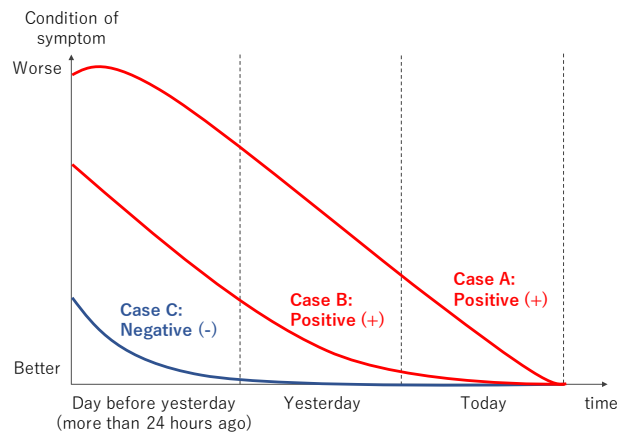
a. Within 24 hours, including today

Slight fever in the morning→absence from labo meeting→defervesce→receive an express home delivery that I did't expect to be able to receive <u>today</u>	(fever＋)
Had high fever but I went back to work <u>after 4 hours</u> because temp returned to normal	(fever＋)

b. Yesterday

The label for symptoms that occurred yesterday are dependent on the disease or symptom.

I did not heal from the cold <u>yesterday</u>	(cold＋)
Right now healthy except I have no appetite strange because I had fever <u>yesterday</u> but temp is back to normal now.	(fever＋)

c. Past Symptoms Including Two or More Days Ago

When I entered the sauna, sweat didn't come out at all. Then did some intense sports and got a high fever <u>that night</u>. So today I will drink Pocari sweat before going to the sauna	(fever−)
<u>I remember</u> in the festival before that I got a 39 degree fever, but no one decided to go home so I just stayed.	(fever−)

d. Recent Occurrence

<u>Recently</u> head hurts… whyyyyy	(headache＋)
He died <u>for three days</u> mysteriously from high fever	(fever＋)

e. Recurring Symptom that Still Persists

<u>I have been feeling a cold the whole winter.</u> Phlegm is yellow	(cold＋, cough ＋)
Uhh… if you eat pork, somehow I always have <u>diarrhea</u> … orz	(diarrhea＋)

f. Unknown Time

We estimate the time from the situation.

Diarrhea the next day after grilled meat	(diarrhea＋)
I guess major symptom of this year's Influenza is cough, since I had a fever and a terrible cough.	(influenza−, fever−, cough −)

2.5. Location of Symptpm

a. Same Region as User

We regarded a region as a prefecture or a smaller area. Note that we don't consider a symptom that has happened in countries outside of Japan.

Person in the train intensely coughing. I hope he won't get a cold	(cough＋)
*OMG! OMG! OMG! There seems to be a patient with new influenza near here. Scary... But, honestly speaking, it's quite lucky that the school is shut down ^p^*	(influenza＋)

b. Same Region as User – Implied

We regarded as a symptom in the vicinity and labeled **"p" (positive)** regardless of living together or not (i.e. family members). We also labeld **"p" (positive)** when a symptom was observed from hearsay. However, we don't consider a symptom that has happened in countries outside of Japan.

Having a cold is prevalent in my family now!! Except my dad.. Gargle is important okay!!	(cold＋)
My daughter has a fever⋯	(fever＋)
When you have a cold⋯ do I work or something? Should I move around?	(cold＋)
I want the man to cease coughing and to stop trying to pass a cold to me! I will not be affected though	(cough＋, cold＋)

c. Symptoms in a Group

As for symptoms of people belonging to a specified group in the vicinity (school, club, etc.), we labeled them **"p" (positive)**. Other cases, like symptoms belonging to blog friends, should be labeled as **"n" (negative)** since it is difficult to determine their location.

Everyone in my club is going to a meet and greet, but I'm worried since the flu is running rampant.	(influenza＋)
Everyone has diarrhea, was there an outbreak of food poisoning??	(diarrhea－)
When you're surrounded with people who are coughing, you gotta wash your hands more than usual.	(cough－)
I met this person through a dog-related blog who has a bad stuffy nose and can hardly breathe. You can't brush a head cold off as merely a head cold.	(runny nose－)
It's awful that the flu is going around at school right before the National Center Test for University Admissions.	(cold+)

d. Symptoms of Other People in an Unspecified Area

If you have a cold, you had better to go to otorhinology. All problems will be solved.	(cold－)
I think there are many people who have a cold⋯	(cold－)

e. Symptoms of Another Person Connected in Social Networks

When conversing with other people through retweets or mentions to a specified user (@username), maybe warnings and encouragement can be seen towards another person who is sick. Judge if this person is in the same area or not. Obviously, retweets (RT) from strangers are labeled **"n" (negative)**. Note that there are no retweets or mentions to a specified user (@username) in the MedWeb dataset.

A person posting "I have a fever," "I need to take a medicine," or "I feel sick" on SNS every day finally said that "I don't wanna go to hospital because I don't wanna waste my holidays." I saw the last post and decided to give a piece of advice to her.	(fever－)