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Discontinuity of Representativeness Heuristic

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■ Abstract ■

The individual behavior on considering prior information when one assesses the probability of uncertain event by representativeness heuristic has been investigated. While prior researches proposed two contrasting behaviors on the employment, we tested the mixed hypothesis that individual ignores the prior information to some extents and begins to consider it above certain threshold when the evidence of representativeness is not salient. The threshold effect of prior probability is positively experimented and the results strongly support the discontinuity hypothesis of representativeness heuristic.

1. Introduction

Many decisions are based on beliefs concerning the likelihood of uncertain events which may be expressed in tangible amounts or not. For those decisions, of course, people rely on a limited number of heuristic principles which reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations. When adopted, these heuristics (which are called availability, representativeness, and anchoring) lead to certain predictable and consistent biases in individual judgments concerning the likelihood of uncertain events.

In a series of papers[9,10,17,19], Kahneman and Tversky (K and T) supported the hypothesis that individuals judge by something like representativeness and ignore prior probability. In their experiments people gave nearly the same posterior probabilities for each of the different problem description in spite of the substantial change in the priors and, therefore, simply did not behave as predicted by economic theory and law of mathematical statistics. The final conclusion is that the representativeness heuristic is a good descriptive model of behavior under uncertainty especially for untutored and unmotivated (or at least not financially motivated) individuals.

Meanwhile, Grether[5] derived a slightly different implication from the K and T's hypothesis that the subject mainly employs the

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representativeness heuristic but some consideration is also being given to the prior probability. Thus Grether reinterpreted the K and T's hypothesis as follows: "Individuals place greater weight on the likelihood than on the prior odds and consider both factors when making a decision." His conclusion is that individuals tend to give too much weight to the evidence and thus too little weight to their prior beliefs, though priors are not ignored. In addition to the main results, he also pointed out there is some evidence that with increasing experience and financial motivation individuals rely less on the rule of thumb and act more like Bayesians.

In this paper, we propose a new hypothesis on the consideration pattern of prior probability in the representativeness heuristic. Our hypothesis is consistent with the Grether's in that the both effectively employ the priors during the individual reasoning process though not fully as much as the actual amount, i.e., underweighted. In contrast to Grether's, however, in new hypothesis one begins to consider the priors above a certain threshold value and below which the priors are totally ignored as in the K and T's assumption. It is basically different from the Grether's continuous consideration hypothesis where one continuously employs the priors even for low range.

Gaba and Viscusi[4] tested a similar threshold effect on subjective risk perception by using a sample of workers who responded to 0-1 questions in survey. Reference point or cut-off value for assessing an activity as risky are confounded by various characteristics of the respondents. It was shown that, given a quantitative risk measure, the thresholds varied systematically, particularly by education.

The representativeness heuristic and the nature of the evidence concerning it are briefly discussed in Section 2. The hypothesis and the experimental results are presented in Section 3. The discussion of the results and the conclusion are given in Section 4. The questionnaires for experiments are attached in Appendix.

2. Judgement by Representativeness Heuristic

A subjective probability[14] denotes any estimate of the probability of an event, which is given by a subject, or inferred from his behavior. These estimates are not assumed to satisfy any axioms or consistency requirements. The regret theory[1] and the similarity model [12,13] predicted systematic violations of independence, monotonicity, and invariance. On the other hand, an objective probability denotes values calculated, on the basis of stated assumptions, according to the laws of the probability calculus. It is evident that this terminology is noncommittal with respect to any philosophical view of probability.

K and T[17] proposed that when judging the subjective probability of some uncertain event people often resort to heuristics, or rule of thumb, which are less than perfectly correlated with the variables that actually determine the event's probability. One such heuristic is representativeness, defined as a subjective judgement of the extent to which the event in question "is similar in essential properties to its parent population" or "reflects the salient features of the process by which it is generated"[15]. For example, when A is highly representative of B, the probability that A originates from B is

judged to be high. On the other hand, if A is not similar to B, the probability that A originates from B is judged to be low.

Although in some cases more probable events also appear more representative, and vice versa, reliance on the representativeness of an event as an indicator of its probability may introduce two kinds of systematic error into the judgement. First, it may give undue influence to variables that affect the representativeness of an event but not its probability. Second, it may reduce the importance of variables that are crucial to determining the event's probability but are unrelated to the event's representativeness.

The reason why this approach to the judgement of probability leads to such errors is that representativeness is not influenced by several factors that should affect judgments of probability. One of these factors is the prior probability that is actually an our main concern in this paper. From the well known engineer-lawyer experiment by K and T[17], it was emprically verified that the subject used prior probability correctly only when they had no other information. However, prior probabilities were effectively ignored when a description was introduced, even when this description was totally uninformative.

The second factor that have no effect on representativeness but should have a major effect on probability is the sample size. Several interesting experiments[9] showed that intuitive judgements are dominated by sample proportion and are essentially unaffected by the sample size, which plays a crucial role in the determination of the actual posterior odds. Consequently, if probabilities are assessed by representativeness, then the judged probability of a sample statistic will be essentially independent of sample size.

The third factor is misconception of randomness. For example, from the several tosses of coin, people expected that the essential characteristics of the process will be represented, not only globally in the entire sequences but also locally in each of its parts. Therefore, individual who have already experienced biased outcomes, for example H-H-H-H in the four tosses of coin, views the chance as a self-correcting process in which a deviation in one direction induces a deviation in the opposite direction to restore the equilibrium. It is the well-known gambler's fallacy.

The fourth factor is the unwarranted confidence which is produced by a good fit between the predicted outcome and the input information. Thus, people often predict by selecting the outcome that is most representative of the input. The confidence they have in their prediction depends primarily on the degree of representativeness, on the quality of match between the selected outcome and the input, with little or no regard for the factors that limit predictive accuracy.

The last factor is the failure to understand the effect of regression. It may lead one to overestimate or underestimate probability without consistency as shown in the experiments of flight training[10].

So far, we have briefly discussed the nature and fallacy of representativeness heuristic and itemized several factors that are ignored, but should be considered in assessing the probability by representativeness heuristic. Some experimental results have been proposed to describe the individual's heuristic decision behavior for probability judgement, which was formally suggested by K and T. Grether is one of the

researchers who studied the individual's consideration behavior of prior probability. Actually, he found that the bias persist, but was weaken by some consideration of prior probability. In the next section, we focus especially on how people respond to the prior information when they are confronted with the various posterior informations.

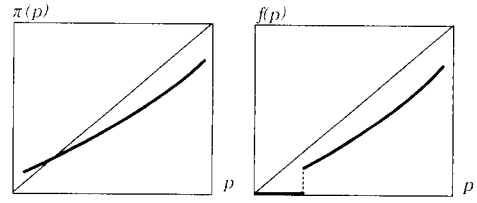
3. Hypotheses and Experimental Results

3.1 Hypotheses

The experimental works of K and T presented descriptive evidence that prior probability is usually ignored in estimating a posterior probability of uncertain event. On the other hand, Grether pointed out that prior probability is considered when employing the representativeness heuristic regardless of its magnitude, even if very small.

We suggest a hybrid of the extremes above. The hypothesis assumes that there exists a point of prior odds above which individuals begin to employ the prior probability and below which they do not. It is very similar to the physiological phenomenon that individual cannot feel a stimulus from the environment until it becomes stronger than a certain threshold. For example, human cannot hear the sound whose frequency is under the certain level. The more certain the prior belief is, the more the individuals employ it when evidence is not strong. Now consider the reverse direction. If we decrease the magnitude of prior probability, there will be a point below which subjects no longer consider the prior odd at all in their decision making. Of course, that point depends not only on the posterior probability but also on the individual ability of mental recognition. If one is highly confident of the outcome by the representativeness, he would not highly rely on prior information even though the actual posterior information favors the other outcome. In case of the strong evidence, our hypothesis is consistent with the K and T's observation.

Interestingly, our hypothetical weighting function of prior probability, $f(p)$, contrasts to the probability weighting function, $\pi(p)$, in prospect theory[11] where the probability is overweighted for small values of p below certain point as in <Figure 1>. The curvature of the weighting function was empirically examined by Wu and Gonzales[20]. In both cases the perceived probabilities, $\pi(p)$ and $f(p)$, are underweighted for most of the open interval and change abruptly near the endpoints. The apparent discontinuities of $\pi(p)$ and $f(p)$ at the endpoints can lead the individual to discard events of extremely low probability and to treat events of exteremly high probability as if they were certain. Consequently, they are not well behaved near the endpoints.



a) Weighting Function b) Our Hypothesis

$f(p)$: prior probability considered in the representativeness heuristic

p : actual prior probability

<Figure 1> Comparison of Weighting Function and Our Hypothesis

〈Table 1〉 Summary of Patient's Record

Patients	Symptom	History
Patient 1	Stomachache, Full of stomach, Feel heavy and sleepy	She overate and overdrank at the birthday party last night.
Patient 2	Lack of strength, Troubles in eyesight, Neuralgia, Loss of hairs, Sleepy, Deteriorating gum condition.	not available
Patient 3	Sore throat, Headache, High fever, Cough, Nasal mucus	She has never caught a cold in her life. She got an injection against influenza.
Patient 4	Mild headache, Lack of strength, Tiredness, Dizziness, Occasional indigestions, Insomnia	Because of his doctoral preliminary examinations yesterday, he was extremely strained and still has severe mental fatigue.
Patient 5	same as Patient 4	She has suffered from hereditary anaemia for a long time.
Patient 6	same as Patient 4	not available
Patient 7	same as Patient 4	Overwork last night, Some trouble with his wife

In sum, although the extent to which prior probability is considered in the representativeness heuristic depends on the confidence intensity of evidence, there will be a critical point above which individuals begin to give weight to the prior probability when applying the representativeness heuristic. We propose two hypotheses as follows :

Hypothesis 1 (strong-evidence case) *When the evidence of representativeness is strong, individuals give no weight to the prior information.*

Hypothesis 2 (weak-evidence case) *When the evidence of representativeness is weak, individuals resort to the prior information, f(p), though underweighted. Furthermore, there exists a threshold point of prior probability above which individuals employ the prior information and below which they do not.*

3.2 Structure of Experiment

In order to test the hypotheses, a series of medical diagnoses were conducted using 14 graduate students from Kyung Hee University. The experiment is composed of medical diagnoses for the 7 patients who were suffering from one of such well known diseases as cold, indigestion, malnutrition, anaemia, mental strain, and geriatric diseases. The subjects were required to describe his(her) diagnosis with a probability that each patient was suffering from one of several diseases given above. The 7 simple patient's records and questionnaires are given in Appendix. The patient's records are summarized in <Table 1>.

Basically, the 7 patients are divided into two groups according to the strength of their medical symptoms. As the first group, Patient 1, 2, and 3 have strong symptoms of indigestion, geriatric diseases and cold respectively. As the second group, Patient 4, 5, 6, and 7 have same vague and indefinite symptoms from which it is hard to make confident diagnosis. In the experiments, the medical symptom of each patient corresponds to the representativeness of disease, and, likewise, the previous history of patient is assumed to represent the prior probability possi-

〈Table 2〉 Group of Patients

Group of Patients	Patients	Level of Symptom	Quality of Prior Information	Expected Diagnosis
Group 1	Patient 1	strong & definite	consistent with the symptom	highest prob. of indigestion
	Patient 2	strong & definite	no prior information	highest prob. of geriatric diseases
	Patient 3	strong & definite	contradicts the symptom	highest prob. of cold
Group 2	Patient 4	weak & indefinite	highly favors mental strain	highest prob. of mental strain
	Patient 5	weak & indefinite	highly favors anaemia	highest prob. of anaemia
	Patient 6	weak & indefinite	no prior information	equal prob. of diseases
	Patient 7	weak & indefinite	weak prior information	equal prob. of diseases

bly considered in making diagnosis. In this sense, the first group has strong and definite evidences of representativeness, while the second group has weak evidences of representativeness. One thing to be noted is that each patient has a different previous history. The patient group according to their symptoms and previous histories is given in <Table 2>.

3.3 Experimental Results

<Table 3> is a summary of diagnoses obtained from 14 students. The last column represents the average percentage of each disease for each patient.

From the simple inspection of the first group, we know that distinctly high percentages were given to the indigestion, geriatric diseases and cold for Patient 1, 2 and 3 respectively as expected. From the results of the second group, relatively high percentages were not found except on the mental strain for Patient 4 and on the anaemia for Patient 5. Note that any significant differences in diagnoses were not found between the results of Patient 6 and 7, and that the diagnosis of Patient 4 is quite different from that of Patient 5 even though these two patients have exactly same symptoms.

For a statistical analysis of the data in <Table 3>, the F-statistic is used to test the hypothesis that the average percentages of diagnoses are identical for each patient. <Table 4> is a summary of F values and its test results. The results show that a certain decisive diagnosis was given to each patient except Patient 6 and 7.

〈Table 4〉 Results of Mean Difference Test

Patients	F value (MSTR/MSE)	H_0 : Average percentages are the same(significant level of 95%)
Patient 1	48.37	Reject H_0
Patient 2	11.66	Reject H_0
Patient 3	47.95	Reject H_0
Patient 4	5.12	Reject H_0
Patient 5	12.99	Reject H_0
Patient 6	2.15	Accept H_0
Patient 7	2.20	Accept H_0

In sum, we can elicit some interesting results as follows: First, for group 1 (Patient 1, 2 and 3) where medical symptoms are strong, i.e. evidence of representativeness is strong and definite, individuals gave no weight to the prior information. In case of Patient 3, even though the prior information contradicts the symptoms of cold, the highest percentage was given to a cold.

Second, for group 2 (Patient 4, 5, 6 and 7)

〈Table 3〉 Experimental Results

Patients	Type of Disease	Student's Diagnosis (%)														Average
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Patient 1	Cold	0	5	5	0	5	50	0	0	0	0	20	13.3	9	0	7.66
	Indigestion	99	85	95	100	40	50	55	100	100	40	80	20	90	60	72.43
	Dystrophy	9	5	0	0	5	0	40	0	0	0	0	13.3	0	10	5.24
	Anaemia	9	5	0	0	40	0	0	0	0	30	0	13.3	0	5	6.66
	Catatonia	1	0	0	0	5	0	0	0	0	0	0	13.3	0	20	2.81
	Geriatric Dis.	0	0	0	0	0	0	0	0	0	0	0	13.3	0	0	0.95
	Not Classified	0	0	0	0	5	0	5	0	0	30	0	13.3	1	5	4.24
Patient 2	Cold	0	0	0	20	10	0	10	0	0	30	40	13.3	0	0	8.81
	Indigestion	0	0	0	0	10	0	5	20	0	30	10	13.3	2	10	7.16
	Dystrophy	0	2	0	0	10	0	10	0	0	0	0	13.3	0	0	2.52
	Anaemia	0	2	10	0	15	0	5	0	0	0	0	13.3	10	20	5.37
	Catatonia	0	0	0	0	15	0	0	0	0	0	20	13.3	0	30	5.59
	Geriatric Dis.	90	96	85	60	20	50	10	80	50	40	30	20	0	30	47.21
	Not Classified	10	0	5	20	10	50	60	0	50	0	0	13.3	88	10	23.31
Patient 3	Cold	80	80	90	50	40	90	80	100	80	60	50	20	95	20	66.79
	Indigestion	0	0	0	0	5	10	0	0	0	0	0	13.3	0	10	2.74
	Dystrophy	0	5	0	0	5	0	0	0	0	0	0	13.3	0	0	1.66
	Anaemia	0	5	0	0	10	0	5	0	0	0	0	13.3	0	20	3.81
	Catatonia	0	10	0	0	10	0	0	0	0	20	0	13.3	0	30	5.95
	Geriatric Dis.	0	0	0	0	5	0	0	0	0	0	0	13.3	0	0	1.31
	Not Classified	20	0	10	50	25	0	15	0	20	20	50	13.3	5	20	17.74
Patient 4	Cold	0	2	0	0	10	40	15	0	0	0	80	13.3	0	0	11.45
	Indigestion	0	2	0	0	10	0	5	0	0	40	10	13.3	5	20	7.52
	Dystrophy	1	4	5	30	10	0	25	0	0	0	0	13.3	20	0	7.74
	Anaemia	0	2	5	0	10	40	5	0	0	30	0	13.3	10	20	9.66
	Catatonia	99	90	90	70	30	0	0	100	0	0	0	20	40	40	41.36
	Geriatric Dis.	0	0	0	0	5	0	0	0	0	10	0	13.3	0	0	2.02
	Not Classified	0	0	0	0	25	20	50	0	100	20	10	13.3	25	20	20.24
Patient 5	Cold	0	2	0	0	15	50	10	0	0	20	80	13.3	0	0	13.59
	Indigestion	0	2	5	0	15	0	5	0	0	20	10	13.3	10	0	5.74
	Dystrophy	0	6	10	10	10	0	5	0	0	0	0	13.3	20	20	6.74
	Anaemia	90	60	80	80	15	50	40	70	50	20	0	20	35	60	47.86
	Catatonia	10	30	5	10	15	0	0	30	0	20	0	13.3	2	10	10.38
	Geriatric Dis.	0	0	0	0	0	0	0	0	0	0	0	13.3	0	0	0.95
	Not Classified	0	0	0	0	30	0	40	0	50	20	10	13.3	33	10	14.74
Patient 6	Cold	0	2	0	0	15	80	15	0	0	30	70	13.3	0	0	16.09
	Indigestion	0	2	0	10	15	0	5	0	0	30	10	13.3	10	10	7.52
	Dystrophy	0	2	20	0	15	0	10	0	0	0	0	13.3	30	30	8.59
	Anaemia	0	4	50	0	15	20	5	60	0	20	0	20	20	30	17.43
	Catatonia	40	90	10	40	15	0	0	10	0	0	0	13.3	5	0	15.95
	Geriatric Dis.	0	0	0	0	15	0	0	0	0	0	20	13.3	0	0	3.45
	Not Classified	60	0	20	50	10	0	65	30	100	20	0	13.3	35	30	30.95
Patient 7	Cold	0	2	0	0	10	50	5	15	0	0	50	13.3	0	20	11.81
	Indigestion	0	0	0	0	5	0	0	0	0	0	0	13.3	0	0	1.31
	Dystrophy	40	33	15	33	20	0	0	75	0	50	30	13.3	20	20	24.95
	Anaemia	60	60	85	17	10	0	50	0	0	50	0	13.3	50	30	30.38
	Catatonia	0	5	0	33	20	50	10	0	0	0	20	20	0	0	11.29
	Geriatric Disease	0	0	0	0	5	0	5	0	0	0	0	13.3	0	0	1.66
	Not Classified	0	0	0	17	30	0	30	10	100	0	0	13.3	30	30	18.59

where medical symptoms are vague, i.e. evidence of representativeness is weak and indefinite, the decision is highly depend on prior information. Even though four patients in group 2 have exactly same symptoms, the quite different decisions were given to Patient 4 and 5 because of their different patient's histories. The prior information actively works in case of indefinite evidence.

Third, in the case of having vague and indefinite evidence on representativeness, there exists a minimum required strength of prior information to make decision confidently. The records for Patient 5, 6 and 7 are different from each other only in the strength of their prior informations. That is, Patient 5 has the strongest prior information, and Patient 6 has no prior information, and Patient 7 has a weak prior information. The reason why a decisive diagnoses were not given to Patient 6 and 7 is that their prior information are not strong enough to exceed certain threshold, i.e. minimun required strength.

3.4 Some Comments from Students

Almost all the students responded that they utilized the representativeness heuristic and tried to remember what typical symptoms they associated with specific disease in undertaking the experiment. In fact, we didn't expect their utilization of availability heuristic[18]. The decision process that they used in making the diagnosis can be summarized as follows :

First, consider the symptoms. Second, eliminate some diseases which contradict the symptoms in the further consideration. It means that individual's decision procedure is partly based on elimination by aspects[8]. Third, consider the previous history and compare it with the symptoms. If they are incompatible each other, give more weight to the symptoms. Fourth, when there is no previous history, search the personal data for clue of age, weight etc.

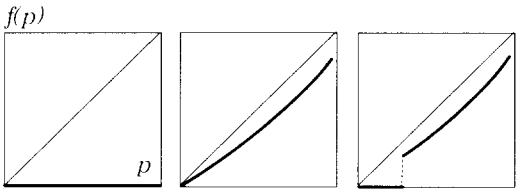
We also received some helpful comments from students. One is that many of the students made a diagnosis based on their own experiences because of total lack of knowledge in the medical discipline. It indicates individual's mixed utilization of availability and representativeness heuristic in decision making. In that case, for example, it may lead to the bias that student who had been suffered from anaemia overweights the possibility of anaemia in making a diagnosis, that is, due to the retrievability of instances[18]. The other insightful comment is that some of the diseases seemed to be interdependent or strongly correlated rather than exclusive. It not only makes individual uncomfortable in assessing probability but also may lead to the bias due to the illusory correlation[2] which overweights the possibility of diseases thought to be related.

One anonymous referee gave us a comment on new interpretation of the reasoning process that was possibly used in this diagnosis experiment. As compared to the representativeness heuristic, people may recognize symptom and patient history as two independent informations with no precedence relationship and make a diagnosis based on the dominance and medical consistency between symptom and history.

4. Conclusion and Discussion

The individual behavior on considering prior

information when one assesses the probability of uncertain event by representativeness heuristic has been investigated. K and T assumed that individual ignores the prior probability and Grether assumed that individual considers the prior probability. While they proposed two contrasting behaviors, we tested the mixed hypothesis that individual ignores the prior information to some extents and begins to consider it above certain threshold when the evidence of representativeness is weak. The various consideration behaviors of prior probability can be dipicted as in <Figure 2>.



a) K and T's b) Grether's c) Our Hypothesis

$f(p)$: prior probability considered in the representativeness heuristic

p : actual prior probability

<Figure 2> Consideration Patterns of Prior Probability

It is interesting to compare $f(p)$ with the weighting function, $\pi(p)$, in prospect theory by K and T[8] or with $S(P_A)$ in the ambiguous situation[3,7]. In prospect theory, $\pi(p)$ is exaggerated, i.e. $\pi(p)>p$, for small p. Conversely, in our hypothesis, $f(p)$ is completely ignored for small p. Further research will be required to these different behaviors. Meanwhile, our hypothesis may be supported by the threshold explanation of Slovic et. al.[16]. They explained that one of reasons why people buy more insurance against events having a moderately high probability of inflicting a relatively small loss than against low-probability, large-loss event is that people refuse to protect themselves against losses whose probability is below some threshold. That is, people think the probability below certain threshold is negligible. Threshold concept makes good intuitive sense. There are so many things in life one can consider. Without some sorts of threshold for concern, people would spend their entire lives to worry about negligible something. On the other hand, when the evidence of representativeness is strong, our hypothesis is exactly same as the K and T's hypothesis.

The threshold effect of prior probability on representativeness heuristic was positively experimented, and consequently discontinuity of the heuristic was emprically proved. However, this evidence is far from being conclusive because there is a possibility that individual's response may be changed with different situations or problem contexts[6]. At this time, quantification of threshold value seems to be impossible because of its problem or individual dependent property, but it would be valuable research to investigate the factors which affect threshold qualitatively.

Appendix

A. Scenario

Dr. Lee is a practicing physician who has a private clinic in the suburbs of Seoul. He makes consultations and diagnoses, which are normally based on analysis of clinical examinations as well as on the past history of patients. Sometimes Dr. Lee cannot make a diagnosis confidently because the clinical symptoms are not clear. As a result, he often relies on the additional information provided in the statement and history of patient rather than on the vague symptoms. In some cases, even if the clinical symptoms are well defined, he is hesitant to make a conclusive decision because the historical and environmental information of the patient directly contradicts the apparent symptoms.

An incorrect diagnosis could be fatal to the patients. Yet, like the above inconsistencies, a relatively high probability of misdiagnosis is built-in to the doctor's decision making process. Uncomfortable with making such potentially fatal responsibility, Dr. Lee decided to quit the hospital. Instead, he decided to begin research on how medical diagnoses could be made under uncertainty when various symptoms are figured out in complex situations. As the first step, he visited 200 colleagues in order to collect the fundamental information on the diagnoses derived from the various medical symptoms and side information of their patients.

B. Questionnaires

The attached sheets are 7 abridged records of patient selected from the master file of patient of the Dr. Lee's clinic. The above 7 patients were treated for one of such well known diseases as cold, indigestion, dystrophy(malnutrition), anaemia, catatonia(mental strain), and geriatric diseases(infirmities of old age).

From now on, assume that you are a physician. Please describe your medical diagnosis with a probability that the following patients are suffering from one of several diseases given above. Also describe your reasoning used in making such diagnoses shortly if available.

<table>
<tr><td colspan="8">PATIENT 1</td></tr>
<tr><td>Name</td><td colspan="3">Juli Ingster</td><td>Age</td><td>28</td><td>Sex</td><td>F</td></tr>
<tr><td colspan="2">Occupation</td><td colspan="6">Housewife</td></tr>
<tr><td>Weight</td><td>130 lbs</td><td>Height</td><td>5.3 ft.</td><td colspan="2">Blood Type</td><td colspan="2">A</td></tr>
<tr><td colspan="8">Symptoms : Stomachache, Full of stomach, Feel heavy and sleepy</td></tr>
<tr><td colspan="8">Patient's History : She overate and overdrank at the birthday party last night.</td></tr>
<tr><td colspan="8">1. Physician's Opinion (total 100%)</td></tr>
<tr><td colspan="2">Cold
Indigestion
Dystrophy (Malnutrition)
Anaemia</td><td colspan="2">(%)
(%)
(%)
(%)</td><td colspan="2">Catatonia (Mental strain)
Geriatric disease
Cannot classified</td><td colspan="2">(%)
(%)
(%)</td></tr>
<tr><td colspan="8">2. What reasoning did you use in disgnosing the patient?</td></tr>
</table>

PATIENT 2											
Name	Tom Kidner					Age	unknown		Sex	M	
Occupation	Unknown										
Weight	170 lbs		Height	6 ft.			Blood Type			A	
Symptoms : Lack of strength, Sleepy, Troubles in eyesight, Neuralgia, Loss of hairs Deteriorating gum condition											
Patient's History : Not available											
1. Physician's Opinion (total 100%)											
Cold	(%)			Catatonia (Mental strain)				(%)			
Indigestion	(%)			Geriatric disease				(%)			
Dystrophy (Malnutrition)	(%)			Cannot classified				(%)			
Anaemia	(%)										
2. What reasoning did you use in disgnosing the patient?											

PATIENT 3											
Name	Nancy Caplan					Age	25		Sex	F	
Occupation	Secretary										
Weight	134 lbs		Height	5.5 ft.			Blood Type			AB	
Symptoms : Sore throat, Headache, High fever, Cough, Nasal mucus											
Patient's History : She has never caught a cold in her life. She got an injection against influenza.											
1. Physician's Opinion (total 100%)											
Cold	(%)			Catatonia (Mental strain)				(%)			
Indigestion	(%)			Geriatric disease				(%)			
Dystrophy (Malnutrition)	(%)			Cannot classified				(%)			
Anaemia	(%)										
2. What reasoning did you use in disgnosing the patient?											

PATIENT 4											
Name	Jeremy Irons					Age	25		Sex	M	
Occupation	Graduate Student										
Weight	188 lbs		Height	6.1 ft.			Blood Type			O	
Symptoms : Mild headache, Lack of strength, Tiredness, Dizziness, Occasional indigestions, Insomnia											
Patient's History : Because of his doctoral preliminary examinations yesterday, he is extremely strained and still has severe mental fatigue.											
1. Physician's Opinion (total 100%)											
Cold	(%)			Catatonia (Mental strain)				(%)			
Indigestion	(%)			Geriatric disease				(%)			
Dystrophy (Malnutrition)	(%)			Cannot classified				(%)			
Anaemia	(%)										
2. What reasoning did you use in disgnosing the patient?											

PATIENT 5					
Name	Marv Cohen		Age	17	Sex	F
Occupation	High School Student				
Weight	121 lbs	Height	5.4 ft.	Blood Type	B
Symptoms : Mild headache, Lack of strength, Tiredness, Dizziness, Occasional indigestions, Insomnia					
Patient's History : She has suffered from hereditary anaemia for a long time.					
1. Physician's Opinion (total 100%)					
Cold (%) Indigestion (%) Dystrophy (Malnutrition) (%) Anaemia (%)			Catatonia (Mental strain) (%) Geriatric disease (%) Cannot classified (%)		
2. What reasoning did you use in disgnosing the patient?					

PATIENT 6					
Name	Allen Schoemaker		Age	35	Sex	M
Occupation	Teacher				
Weight	150 lbs	Height	5.7 ft.	Blood Type	A
Symptoms : Mild headache, Lack of strength, Tiredness, Dizziness, Occasional indigestions, Insomnia					
Patient's History : Not Available					
1. Physician's Opinion (total 100%)					
Cold (%) Indigestion (%) Dystrophy (Malnutrition) (%) Anaemia (%)			Catatonia (Mental strain) (%) Geriatric disease (%) Cannot classified (%)		
2. What reasoning did you use in disgnosing the patient?					

ATIENT 7					
Name	Todd Chandler		Age	48	Sex	M
Occupation	Lawyer				
Weight	178 lbs	Height	6 ft.	Blood Type	O
Symptoms : Mild headache, Lack of strength, Tiredness, Dizziness, Occasional indigestions, Insomnia					
Patient's History : Overwork last night, Some trouble with his wife					
1. Physician's Opinion (total 100%)					
Cold (%) Indigestion (%) Dystrophy (Malnutrition) (%) Anaemia (%)			Catatonia (Mental strain) (%) Geriatric disease (%) Cannot classified (%)		
2. What reasoning did you use in disgnosing the patient?					

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