In a recent paper posted on Listserv, I analyzed the Bayesian method of diagnosis and concluded it is not employed in practice. On re-reading this paper, I realize its main points are buried among a lot of technical considerations making it difficult to appreciate the importance of these points. I present here these points in the form of numbered items making it easier to understand them.

1. The only goal of diagnosis in practice is to accurately determine the disease causing illness in a patient with symptoms so that appropriate treatment and prognosis can be given for this disease.
2. Diagnosis in practice is challenging because practically every disease occurs in different patients with varying symptoms (presentations). Example, acute myocardial infarction (MI) occurring in a 65 year old man with highly characteristic chest pain as well as in a 40 year old woman with highly uncharacteristic chest pain.
3. The process of diagnosis in practice consists of suspecting a disease (e.g. acute MI) from a presentation and formulating it as a hypothesis which is verified by testing.
4. In the prescribed Bayesian method, the prior probability of a disease such as acute MI is derived from its prevalence and combined with the likelihood ratio (LR) of a test result to generate a posterior probability from which the disease is inferred (diagnosed) in a patient.
5. The prior probability represents prior degree of belief in a disease, LR represents evidence provided by a test result and posterior probability total degree of belief in a disease in the Bayesian method.
6. The Bayesian notion of prior probability as prior degree of belief causes problems in diagnosing acute MI accurately, for example, in some patients. Thus the very low prior probability of acute MI of 7 percent in the 40 year old woman mentioned above represents very strong prior degree of belief against acute MI, which may justify ruling it out without testing which could be a serious diagnostic error. And even if an EKG is performed in this patient and acute ST elevation EKG changes with LR of 13 observed, a posterior probability of only 50 percent would be generated from which acute MI would be

diagnosed to be indeterminate in this patient which again could be a diagnostic error.

7. In the 65 year old man mentioned above, the very high prior probability of acute MI of say, 86 percent represents very strong prior degree of belief degree from which it would be reasonable to infer acute MI in this patient in the Bayesian which is never done in practice. And if an EKG is performed and it reveals non-specific T wave EKG changes with LR of 1, the posterior probability would be very high at 86 percent from which acute MI would be inferred conclusively in the Bayesian method which is not done in practice.
8. The biggest problem with the Bayesian method, in our view, is that its diagnostic accuracy is unknown, so that it is not reliable and thus not employed in practice. For example, a prior probability is not interpreted as a prior degree of belief or a disease diagnosed from a posterior probability generated by combining prior probability and LR in any of the published diagnostic exercises in real patients such as CPCs and clinical problem solving exercises.
9. In diagnosis in practice, a diagnostic hypothesis generated by suspecting a disease from a presentation does not have a prior probability attached to it so that it does not have any prior degree of belief for or against it. The disease hypothesis is verified by performing a test and verified to be correct by a procedure in which a highly informative test result (with LR greater than 10) leads to an accurate diagnosis with a high frequency (85 percent or greater) on repeated testing in patients with varying prior probabilities. Thus acute MI would be diagnosed in both the 40 year old woman as well as in the 65 year old man conclusively with a high degree of accuracy if acute ST elevation EKG changes were observed in both of them.
10. This method of diagnosis employed in practice is the frequentist confidence method, which is the other major method of statistical inference. In this method, it is the objective performance of a highly informative test result in leading to a high frequency of accurate inferences (diagnosis) which is the basis of diagnosis in a given patient, which differs markedly from diagnosis based on the subjective degree of belief represented by a posterior probability, whose accuracy is unknown, in the Bayesian method.

11. The confidence method leads to a highly accurate diagnosis of a disease, such as acute MI for example, in any patient regardless of its prior probability anywhere in the world, as I discuss in my main paper on analysis of the Bayesian method. This is made possible, as I discuss, by the fact that the series of patients with varying prior probabilities anywhere in which we suspect and test a disease such as acute MI for example, constitutes a random sample.
12. The confidence method leads to a diagnosis whose accuracy is consistent with our experience. For example, 86 percent accuracy of diagnosis of acute MI from acute ST elevation EKG changes is consistent with our experience of this diagnosis is 8 to 9 patients with varying prior probabilities that we encounter in practice. In the Bayesian method, on the other hand, the accuracy of a Bayesian diagnosis is unknown as it does not usually correspond to our experience as this diagnosis is made from a posterior probability interpreted as a subjective degree of belief which does not correspond to anything in our experience.
13. In brief, we do not find any reason to employ the Bayesian method for diagnosis in practice from the point of view of diagnostic accuracy. It is well to remember the Bayesian method has been prescribed for diagnosis due to its rationality based on its coherence and not due to its diagnostic accuracy.

Please review and comment on this simplified version of my paper on analysis of the Bayesian method. The numbered items in this version should facilitate comments and/or criticism on parts of this analysis.