

National Health Improvement Association  
1090 Nightengale Ave  
Phoenix, AZ 85004

Independent Mathematical Contractors  
1100 E Sheldon Street  
Prescott, AZ 86301

Dear IMC:

During the past several years, a national debate over health care has taken place. The outcome of this debate is unknown. However, it seems clear that in the future people will be faced with more choices to make regarding their health care. We often get letters from consumers like the one below that express frustration over the complexity of a typical health insurance plan:

Recently I was faced with a decision about which health insurance plan my family should participate in. One possibility was a plan, called the Premier Plan, that costs over \$6000 per year and offers a low deductible of \$600 for my family. This means that my family would need to incur \$600 in health care charges before the insurance plan would share the payment of my health charges. Once this deductible was satisfied, I would pay 20% of the charges and the insurance plan would pay 80% of the charges. The plan also offers a maximum out of pocket of \$6000. This seems like great coverage, but at a considerable price.

The second plan is called the Basic Plus Plan and costs a little over \$500 per year. Because of the lower price, it has a higher deductible of \$1200 for my family. Additionally, once the deductible is achieved the plan will pay 60% of the medical charges my family incurs and I am responsible for the other 40%. The maximum out of pocket for the Basic Plus Plan is \$12,000.

Both plans utilize the same network of doctors although the Premier Plan allows me to go out of network if I split the costs 60/40. With the Basic Plus Plan, I must stay in network except for emergency care.

I am tempted to go with the lower priced Basic Plus Plan, but I am concerned that I could potentially open myself to some high costs if one of my family members falls seriously ill. Can you provide some guidance for me as to how I should choose one of these plans?

I would like you to develop a process for analyzing health insurance plans like the two described by the author of the letter above. Instead of using the exact information above, we would like you to choose two health insurance plans for yourself. These two plans should have different deductibles, coinsurance requirements, out of pocket maximums, and premiums.

With the help of your instructor, I think I have a strategy that you can follow to develop a mathematical model of the insurance plans.

1. Find two health insurance plans on the website <http://www.ehealthinsurance.com>. Organize the information in an Excel worksheet (Tech Assignment 1).
2. Make a table of health insurance charges and corresponding health insurance costs for each of your plans using Excel (Tech Assignment 2).
3. Make a graph of health costs as a function of total medical charges for each health insurance plan (Tech Assignment 3).
4. Locate the point of intersection of the two health insurance plans on your graph and verify its location using algebra (Tech Assignment 4).

I would like you to carry out this strategy and compare two health insurance plans. Assume that the best plan is the one that will cost you the least and explain the mathematical process you followed to find the best plan. Illustrate your process using the details from the two plans you have chosen. I would like your work communicated to me in the form of a technical memo. Your instructor has provided resources to you about this format. An excellent technical memo will communicate your mathematical process for choosing one plan over the other and illustrate the process with the two plans you have chosen. It should also be applicable to other similar plans and allow me or a typical college algebra student to repeat the process with similar plans.

My experience has shown that the decision is largely dependent on the amount of medical charges you might incur. This is the case for the letter above. If this is not the case for your plans, contact your instructor as soon as possible so that he can check your work for errors.

Thanks in advance for your work on this important issue.

Sincerely,  
Dr Zhee Vago  
Executive Director, NHIA