

Sufficiency holds but no separation:

Let A = Gender, C = Hyperlipidemia, and Y = Diabetes. So we have that

$P(\text{Diabetes}|\text{Hyperlipidemia}, \text{Gender}) = P(\text{Diabetes}|\text{Hyperlipidemia})$ but

$P(\text{Hyperlipidemia}|\text{Diabetes}, \text{Gender}) \neq P(\text{Hyperlipidemia}|\text{Diabetes})$

| Diabetes | Hyperlipidemia | Gender | P(Diabetes,Hyperlipidemia,Gender) |
|----------|----------------|--------|-----------------------------------|
| YES | YES | Male | 0.149 |
| YES | YES | Female | 0.112 |
| YES | NO | Male | 0.113 |
| YES | NO | Female | 0.116 |
| NO | YES | Male | 0.082 |
| NO | YES | Female | 0.062 |
| NO | NO | Male | 0.181 |
| NO | NO | Female | 0.185 |

Separation holds but not sufficiency:

Let A = Gender, C = Central Obesity and Y = Hyperlipidemia. So we have that

$P(\text{Central Obesity}|\text{Hyperlipidemia}, \text{Gender}) = P(\text{Central Obesity}|\text{Hyperlipidemia})$ but

$P(\text{Hyperlipidemia}|\text{Central Obesity}, \text{Gender}) \neq P(\text{Hyperlipidemia}|\text{Central Obesity})$

| Central Obesity | Hyperlipidemia | Gender | P(Central Obesity,Hyperlipidemia,Gender) |
|-----------------|----------------|--------|--|
| YES | YES | Male | 0.182 |
| YES | YES | Female | 0.137 |
| YES | NO | Male | 0.171 |
| YES | NO | Female | 0.176 |
| NO | YES | Male | 0.049 |
| NO | YES | Female | 0.037 |
| NO | NO | Male | 0.122 |
| NO | NO | Female | 0.125 |