

Central Obesity = A = co

Gender = Y = gd

Hyperlipidemia = C = hl

VE(medical, co, [hl]) & VE(medical, co, [t=gd, hl])

P(co=NO)

	gd = Female	gd = Male
hl = YES	0.788	0.788
hl = NO	0.583	0.583

P(co=YES)

	gd = Female	gd = Male
hl = YES	0.212	0.212
hl = NO	0.417	0.417

P(co | hl=NO)

[0.583203690852557, 0.41679630914744303]

P(co | gd=Female, hl=NO)

[0.583203690852557, 0.4167963091474431]

P(co | hl=YES)

[0.7876943228020956, 0.2123056771979044]

P(co | gd=Female, hl=YES)

[0.7876943228020956, 0.21230567719790436]

P(co | hl=NO)

[0.583203690852557, 0.41679630914744303]

P(co | gd=Male, hl=NO)

[0.583203690852557, 0.4167963091474431]

P(co | hl=YES)

[0.7876943228020956, 0.2123056771979044]

P(co | gd=Male, hl=YES)

[0.7876943228020956, 0.21230567719790436]

**CentralObesity(A) is independent of gender(Y) given Hyperlipidemia(C)
(Sufficiency)**

$VE(\text{medical}, \text{co}, [\text{gd}]) \ \& \ VE(\text{medical}, \text{co}, [\text{t}=\text{hl}, \text{gd}])$

$P(\text{co} \mid \text{gd}=\text{Female})$
[0.6580471889210673, 0.3419528110789327]
 $P(\text{co} \mid \text{hl}=\text{NO}, \text{gd}=\text{Female})$
[0.5832036908525569, 0.41679630914744303]

$P(\text{co} \mid \text{gd}=\text{Male})$
[0.6732641428414038, 0.32673585715859615]
 $P(\text{co} \mid \text{hl}=\text{NO}, \text{gd}=\text{Male})$
[0.583203690852557, 0.4167963091474431]

$P(\text{co} \mid \text{gd}=\text{Female})$
[0.6580471889210673, 0.3419528110789327]
 $P(\text{co} \mid \text{hl}=\text{YES}, \text{gd}=\text{Female})$
[0.7876943228020957, 0.21230567719790436]

$P(\text{co} \mid \text{gd}=\text{Male})$
[0.6732641428414038, 0.32673585715859615]
 $P(\text{co} \mid \text{hl}=\text{YES}, \text{gd}=\text{Male})$
[0.7876943228020956, 0.21230567719790436]

But CentralObesity(A) is not independent of Hyperlipidemia(C) given gender(Y) (Separation).

The other example can be found by flipping Y & C such that hyperlipidemia=Y and gender=C.
