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RISK/CRISIS MANAGEMENT⑥

危機管理論⑥

RISK TRADE OFF (TRO)(1)

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What is risk trade-off?

Another risk(s) occurred when we try to avoid (eliminate) one risk . あるリスクを回避、除去しようとした時に別のリスクが生じること

Side effect in drug prescription 服薬の副作用

Secondary damage in war strategy 戦争の二次的被害

Unintended consequence in political decision 政策の予期せぬ結果

Unexpected inflation by rapid rate cutting for easing deflation
デフレ緩和のための急速な金利引き下げによるインフレ

Example of RTO

US government asked all factories of which chimney excretes sulfur dioxide to set dust collector. But this order induced another risk when they disposed of sulfur dioxide at any place.

米国政府は(1977年の大気清浄法によって)すべての(石炭を燃やす)工場に対して、煙突から二酸化硫黄が排出しないように集塵機を装着するよう命じた。しかしこの命令は、二酸化硫黄の廃棄物を別のどこかに廃棄しなければならないという新たなリスクを生じさせた

They also need to consume further fuels when they tend to generate same amount of electric power.

しかも、(この集塵機がエネルギー効率を下げるため)工場は同じだけの電力を得るために、より多くの燃料を必要とするようになってしまった

Terminology of Risk Trade Off

Original risk to be avoided

Target risk

Another risk induced by avoiding original one

Against risk

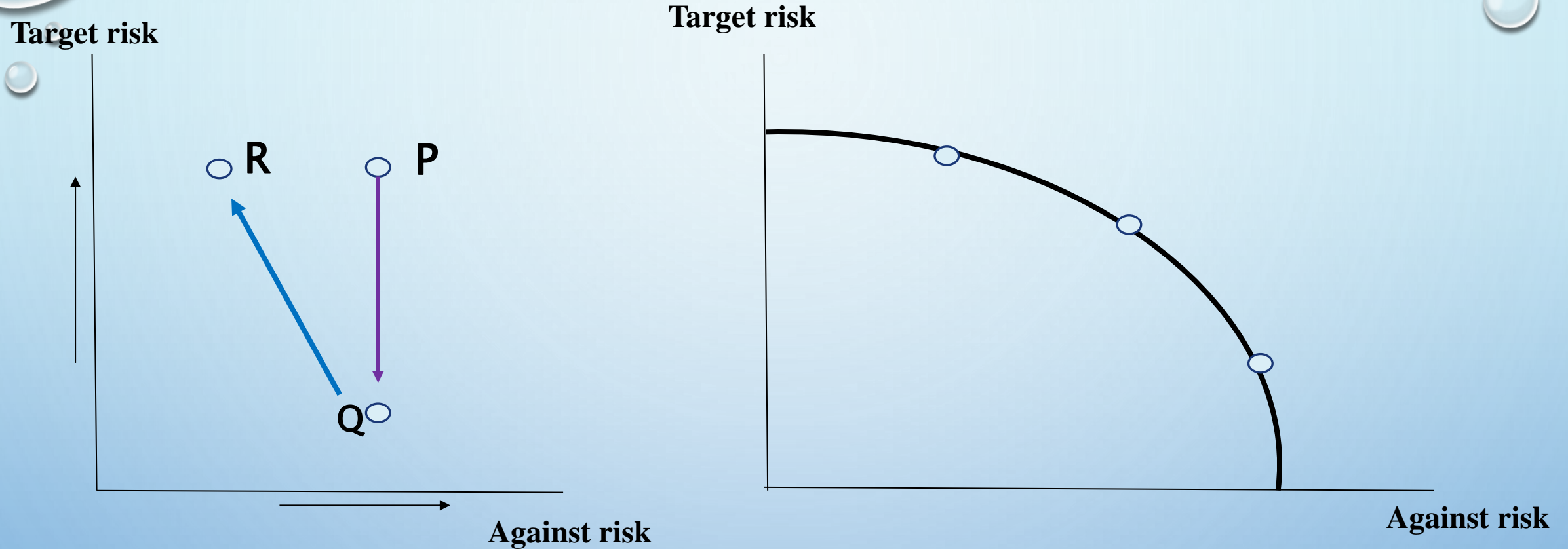
Topology of risk trade off

	Same type	Different type
Same group	Risk offset リスク相殺	Risk substitution リスク代替
Different group	Risk transfer リスク移転	Risk conversion リスク変換

J. D. Graham edit. *Risk VS. Risk* 1995

Topics example	Decision makers	Target risk	Against risk	RTO
Estrogen treatment	Patients	Osteoporosis	Endometrial cancer	Substitution
	Physicians	Bone fracture	Breast cancer	
		Heart disease		
Aged car driver	Government	Car crash	Depression	Substitution
	Physicians		Turnover	Transfer
	Elderly people		Criminal	Conversion
	Family		Nutrition	
Fuel efficiency	Government	Homeland security	Care crash	Conversion
	Industries	Economy		
	Consumers	Air pollution		
	Insurance Company			
Fish eating	Consumers	Heart disease	Cancer	Substitution
	Government			
Chlorine treatment	Government	Cancer	Infectious disease	Substitution
Recycling of lead	Government	Lead poisoning	Lead poisoning	Transfer

Decision making under RTO



We will have to decide the point where target risk and against risk may be balanced (clear the trade off)

Risk trade off in medical-health care

Cervical cancer vaccination

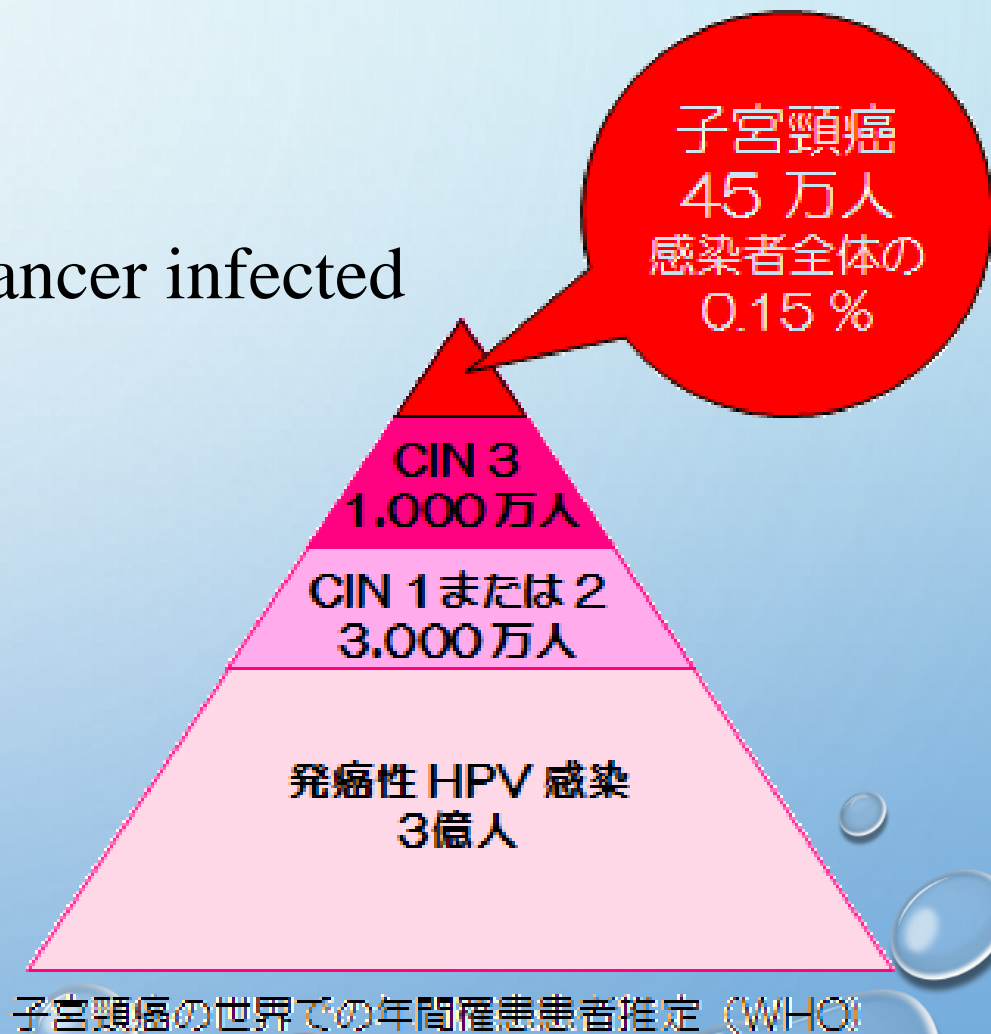
子宮頸がんワクチン

Cervical cancer is female specified epithelial cancer infected through Human Papilloma Virus(HPV)

ヒトパピローマウイルス (HPV) の感染によって発症する女性特有の上皮癌

Survival rate of Cervical cancer

stage ステージ	5 year survival rate 5年相対生存率
Stage I	92.30%
Stage II	77.60%
Stage III	57.80%
Stage IV	21.80%

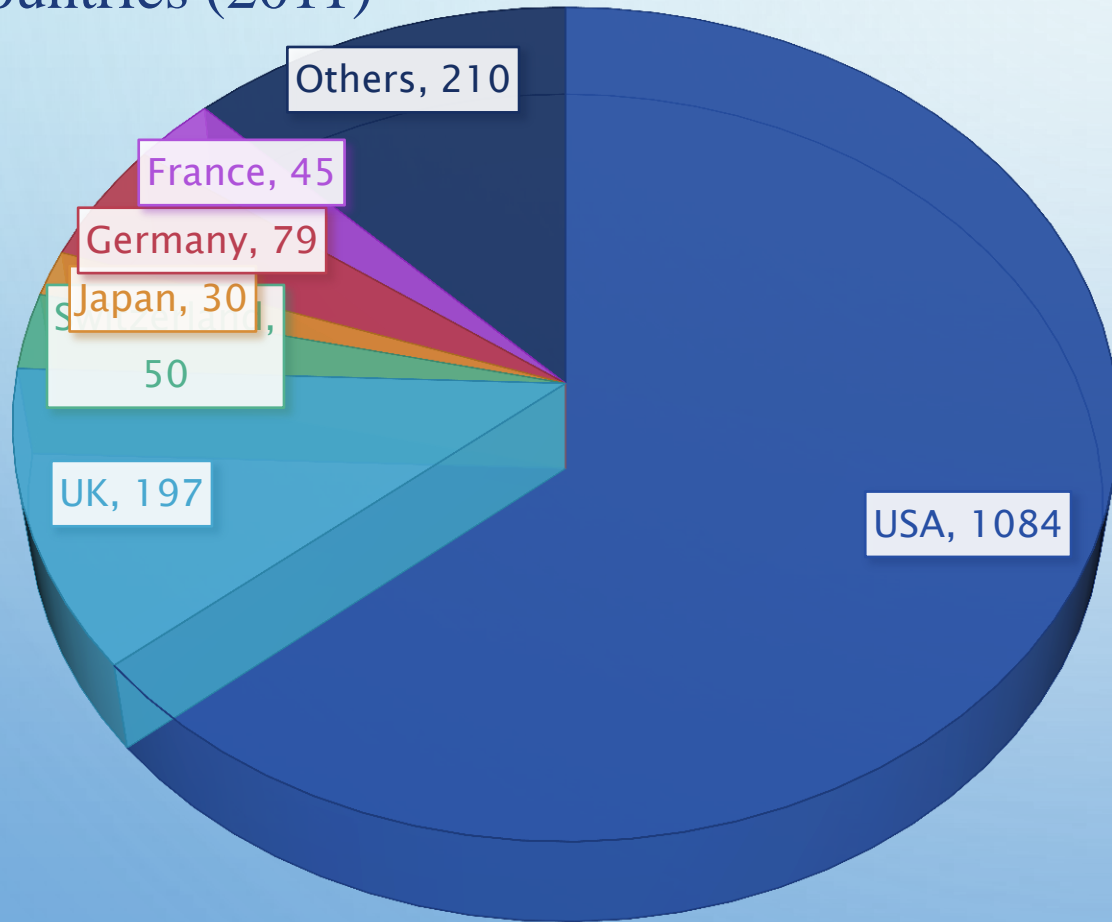


Vaccination is one of the most popular means for preventing cervical cancer. But it has several “reaction”

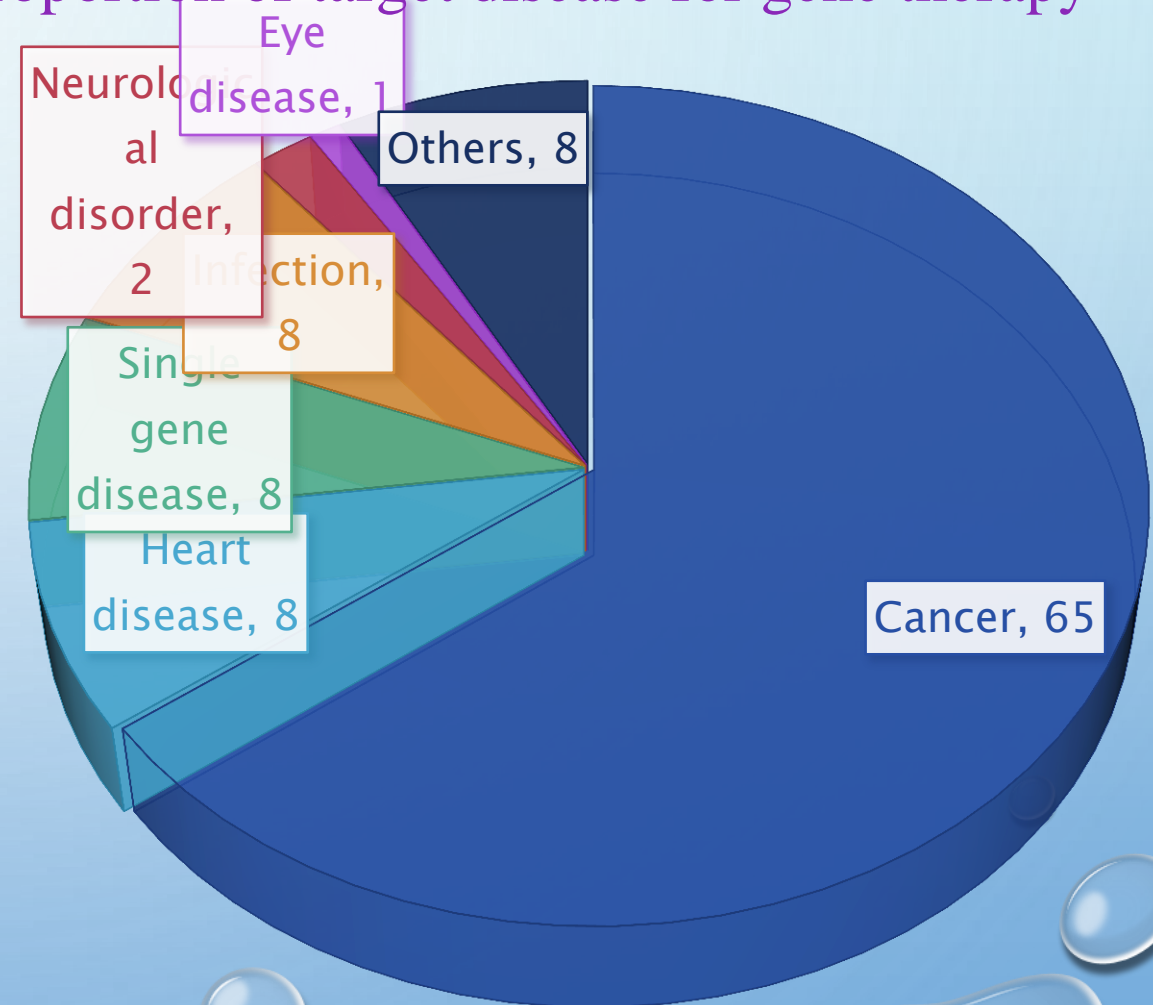
Frequency	Reaction
10% ~	itch, pain at injection, swelling, abdominal pain, muscle pain, joint pain, headache 痒み、注射部位の痛み・腫れ、腹痛、筋痛・関節痛、頭痛 など
1 ~ 9%	hives, dizziness, high fever, headache じんま疹、めまい、発熱 など
~ 1%	pain at hand and leg, numbness, enervation, abdominal pain 手足の痛み、しびれ感、全身の脱力、腹痛など
unknown	pain at hand and leg, fatigue, syncope, muscle pain, joint pain 手足の痛み、疲労感、失神、筋痛、関節痛 など

Gene therapy

Approval number of therapy in each countries (2011)



Proportion of target disease for gene therapy



Serious side effect (reaction) of gene therapy

Medication of Adenovirus vector caused Abnormal immune reaction and the patients died. (1999 in USA)

アデノウイルスベクターの投与によって異常免疫反応が生じ、死亡

Chromosomal insertion of Retrovirus vector in X-SCID gene therapy caused T-cell Leukemia-like symptoms for 5 among 20 patients. (2002~ in France & UK)

X連鎖重症複合免疫不全症(X-SCID)遺伝子治療でレトロウイルスベクターによる染色体挿入により、20名中5名にT細胞白血病様症状が発症

Risk Trade Off VS. Risk Dilemma

Think about risk of drinkable water



Drinkable water usually contain a lot of harmful chemical substances in it.

水には大量の悪性有機物が混入している



Sterilization treatment by chlorine is needed for providing drinking water

そこで、飲み水とするためには塩素による滅菌処理が必要となる



Chlorine (and Trihalomethane as catalyst) sometimes causes a serious side effect; HBP, atopic disease, and cancer if hyper concentration.

塩素や触媒としてのトリハロメタンは、しばしば高血圧、アトピー、そして濃度が高い場合には癌の原因となる

If we tend to avoid such side effect of chlorine, we may be exposed further risk of naturally existing chemical substances which have negative impact on human body

もしわれわれがこうした副作用を避けるために(塩素を使用しなかったとすれば)、さらなる自然由来の化学物質によってわれわれは悪い影響を受ける可能性がある



Modern society are surrounding such dilemma in every place in every day

How do we think about that?