







































































	1890-1930	1931/193- 1951/1955	1951/1955- 1971/1975	1971/1975- 2001/2005
Agricultural & Subsidiary Industries	1,4	1,8	4,9	3,6
Industry	2,7	2,5	5,5	3,7
Construction	0,7	2,7	3,5	1,4
Transport	0,9	3,1	4,4	2,9
Private services	0,9	2,1	1,4	1,9
Public services	0,5	1,3	-0,2	0,2

Yearly productivity increase

(F



























IBM Watson – Algorithm based care

- The world's best Jeopardy player
- After 2011, watson "sitting" in a cancer clinic to provide decision support
- Understands natural language (in writing)
- Reading through a few hundred thousand research papers
- All clinical guidelines, etc.
- · Compare with other historical patients













Poor quality and productivity

3,000 people die prematurely in health care 100,000 injured

10 percent get infection after surgery

Waiting times have been constant

Drug addicts continues abuse

Patients fall between chairs and Organizations

Everyone struggles with coordination of silos

IT systems, worst of all industries

This has lasted for decades

At the same time, we become better at point productivity, measured as eg the five-year survival in different diagnoses, especially cardiovascular



None of the daily political discussions solves these problems

Private - public State (centralized) – municipal (decentralized) More - less resources More - fewer counties / municipalities Reorganisations Laws, rules and policies Freedom of choice

All of these have little or no impact on quality and productivity, (except under certain special circumstances)

Competition seems to have some impact, however, may perhaps go through size - small size is better than large













Different strategies depending on the micro system's characteristics **Simple individuals– Digitalization!**

Try checklists, IT-based self-care Algorithm-based decision Implementing clinical guidelines in decision algorithms High "Do-It-yourself" degree for those who can and want to. Economic incentives and markets Privatization of services which is well defined Economies of scale User-centered design process

Different strategies depending on the micro system's characteristics Complicated individuals– Analyze! Both of microsystems but also flows. Must develop more of analytics and decision support, and automatic process control. While production can often be "simple" Cancer tracks Data! Insurance agency, social services, employment services, family Good Practice and research tips in decision support systems All the conditions exist to begin developing these systems / approaches Patient and user-centered design process

Various Artificial Intelligences GOFAI ANN Neural networks – Machine learning Supervised learning Unsupervised learning Reinforced learning Specific AI

General Al

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Superintelligences

- Dunning kruger effect
- · The Bandwagon effect
- Pareidoli
- · Status quo- bias
- Ostrich behavior
- Pro-innovation bias
- Contemporary bias
- Survival bias
- Zero-risk bias
- Implicit bias

What happens when

- Most primary care visits (with an AI) cost less than 1 \$?
- The most common Laboratory tests can be performed at home?
- (new Lab machine cost less than 1000 \$, 20 different measurements)
- Healthcare sector loses its monopoly
- · More focus on health especially mental health, rather than care

The new health care

- Primary care is gradually discontinued
- Home diagnostics
- Fewer houses more home visits
- Lab & X-ray on the subway, in stores
- Contacts are initiated automatically or by a mentor for deviating lab results/habits
- Expanded screening allows disease detected in Stage
 0 -> Health care instead of treating disease
- Treat risk and not primarily diseases
- Focus on value for the individual

iE

Aids become pets

- Sheepdogs, truffle pigs, falcons
- Robot seal Paro is just the beginning
- Walkers / exoskeleton jumps up and down and wants to go for a walk
- Walkers are connected to each other and know when friends go out and where they are, and controls the promenade there
- They also know who probably could be an interesting new acquaintance and steers toward them
- The fridge reminds elderly of eating and tempts with delicious recipes of what is available

Active elderly care

- Physically active older people feel better
- Give those who want greater physical activity the opportunities
- Our personality gets increasingly eccentric over the years

Virtual wards Flipped Classroom MOOC Programming Interface Design Embedded developer IoT Internet of things Sensor Developer Big data decision Support IT educators Mechatronik robotics

New professions in healthcare and care

logistics Measuring techniques analysts Interface Designer Embedded programmers Database architects Big data analysts Process Designer Industrial Statistician Robot Techniques Mechatronics

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We know that placebo is a strong healing force Shorter rehab with better view from the room Nice parks for a walk Very good restaurants - cafes Green house on the roof Music – Culture Art Patient rooms with concealed technology - No hoses More space in each room for technology gadgets /helping aids Homely furnished rooms, maybe you could choose interior decorating style Body and soul Alternative medicine Animals (robotic and real)

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The best sys	tem	?								
Tabell 6. Health Care Syster	n Perfor	mace Ra	nkings							
Rankning										
	UK	AUS	NETH	NZ	NOR	SWE	swiz	GER	CAN	FRA
Overall rakning	1	2	3	4	4	6	6	8	9	10
Care Process	1	2	4	3	10	11	7	8	6	9
Access	3	4	1	7	5	6	8	2	10	9
Administrative Efficiency	3	1	9	2	4	5	8	6	6	11
Authinistrative Enciency		7	2	8	5	3	4	6	9	10
Equity	1	'								
Equity Health Care Outcomes	1 10	1	6	7	3	2	4	8	9	5

Källa: The Commonwealth Fund.

		Healthcare Access and Quality Index	Tuberculosis	Diarrhoeal diseases	Lower respiratory infections	Upper respiratory infections	Diptheria	Whooping cough	Tetanus	Measles	Maternal disorders	Neonatal disorders	Non-melanoma skin cancer	Cervical cancer	Uterine cancer	Testicular cancer	Hodgkin's lymphoma	Leukaemia	Rheumatic heart disease	Ischaemic heart disease	Cerebrovascular disease	Hypertensive heart disease	Chronic respiratory disease	Peptic ulcer disease	Appendicitis	Inguinal, femoral, and abdominal hemia	Gallbladder and biliary diseases	Epilepsy	Diabetes mellitus	Chronic kidney disease	Congenital heart anomalies	Adverse effects of medical treatment		
	Andorra	95	98	99	85	100	100	98	99	100	100	99	82	93	96	81	70	73	96	84	96	95	97	95	99	93	91	92	96	95	96	88		-100
	Iceland	94	95	97	72	99	100	100	100	100	100	99	90	87	91	67	63	75	94	75	95	93	98	93	99	99	84	92	100	100	98	87		-75
	Switzerland	92	99	91	87	99	100	100	100	100	97	80	76	90	94	75	72	72	96	86	100	85	97	92	96	92	86	89	94	93	85	92		-50
	Sweden	90	98	96	80	99	100	100	100	100	98	90	78	76	95	83	76	67	91	73	88	94	95	79	98	92	86	85	78	95	95	86		-25
	Norway	90	95	92	78	99	100	100	100	100	99	90	81	81	91	65	70	76	93	78	87	99	95	80	98	92	86	80	78	92	93	97		~
	Australia	90	100	94	82	99	100	100	100	99	96	81	52	84	95	86	74	70	86	78	93	98	90	93	98	89	84	83	83	88	90	77	-	-0
	Finland	90	93	99	89	99	100	100	100	100	99	95	84	95	92	78	69	72	96	67	80	75	98	75	96	84	79	76	79	99	87	96		
	Spain	90	92	96	80	99	100	98	100	100	99	85	74	83	90	82	64	66	76	86	91	93	95	96	94	84	74	97	98	86	88	77		
	Netherlands	90	99	94	71	99	100	100	100	100	96	79	80	83	96	74	65	78	93	79	85	97	94	90	95	87	79	82	84	89	88	90		
	Luxembourg	89	99	87	85	99	100	98	100	100	92	93	74	84	96	82	73	65	81	83	88	91	97	91	93	85	78	79	90	86	100	74		
	Japan	89	89	94	61	99	100	100	100	99	98	100	87	77	78	85	89	71	92	94	75	89	91	87	99	99	81	99	90	65	84	84		
	Italy	89	95	96	90	99	100	99	99	100	100	81	74	85	89	76	60	60	78	84	88	72	98	95	98	88	78	93	89	83	85	83		
	Ireland	88	91	94	71	99	100	100	100	100	98	90	59	76	92	82	58	69	87	73	92	93	93	81	99	86	81	81	91	88	86	85		
	Austria	88	95	92	95	99	100	100	100	99	99	84	68	78	89	71	70	67	86	76	93	77	96	88	98	89	84	89	84	78	89	64		
	France	88	92	92	76	99	100	99	100	99	93	86	72	81	93	73	68	64	80	87	89	94	98	91	95	85	81	75	87	92	86	62		
	Belgium	88	94	92	68	99	100	99	100	100	95	83	68	79	91	84	65	67	90	78	86	97	94	84	97	86	79	76	90	87	93	70		
	Canada	88	98	93	73	99	100	99	100	100	96	71	64	79	93	81	71	71	82	72	90	95	92	89	96	86	82	91	78	82	86	82		
	Slovenia	87	92	99	80	98	100	100	100	99	97	91	71	77	92	60	65	74	77	83	78	71	100	76	97	79	76	89	100	98	90	56		
																																_		
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Krav på byggnader

Färre sjukhussängar?

Fler sjukhemssängar i anslutning?

Mer seniorboende, kanske med mer sjukhusinfrastruktur, gaser, sensorer etc

Inomhusnavigering jmf GPS

Smart positionering av alla personer & objekt, kameror

Flödesprocessoptimerade byggnader

Mobila specialistenheter, tex tandvård på sängkanten, operationsrum

Robotvänligt, tex städ- och sociala robotar

Krav på byggnader

Vem är var, på väg vart? Hissar med prognos och prioriteringskapacitet Robothissar Var är alla saker? Lågspänning, särskilda robotkorridorer Antibakteriella ytbeläggningar – slussar Enkelrum – anhörigrum Dolda slangar/teknik läskigt - lättstädat Mer hotell konst –vackert – trädgård - cafe

Which patients will get the best care during the transitional period?

- Stubborn
- Knowledgeable
- Relatively healthy
- High income
- · Living in the city
- Technically adaptive

This will increase inequality in both health and care received during a transitional period

