



無償労働からの解放  
：無償労働の自動化による経済的効果

SHALL WE BE RELEASED FROM  
HOUSEHOLD CHORES?  
; THE ECONOMIC IMPACT OF  
AUTOMATION ON UNPAID WORK

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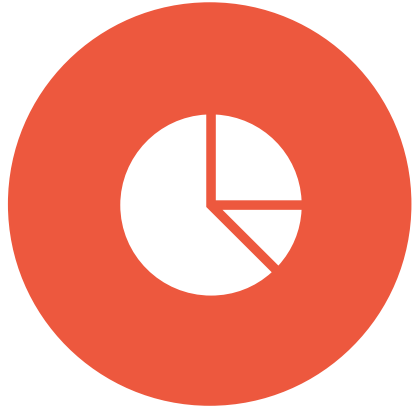
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日本人口学会 第75回大会 南山大学

2023年 6月11日

# MOTIVES



APPLIED NTTA'S  
HOUSEWORK&CARE  
TIME



IMPACT OF RECENT  
TECHNOLOGIES  
SUCH AS AI AND  
ROBOTS.

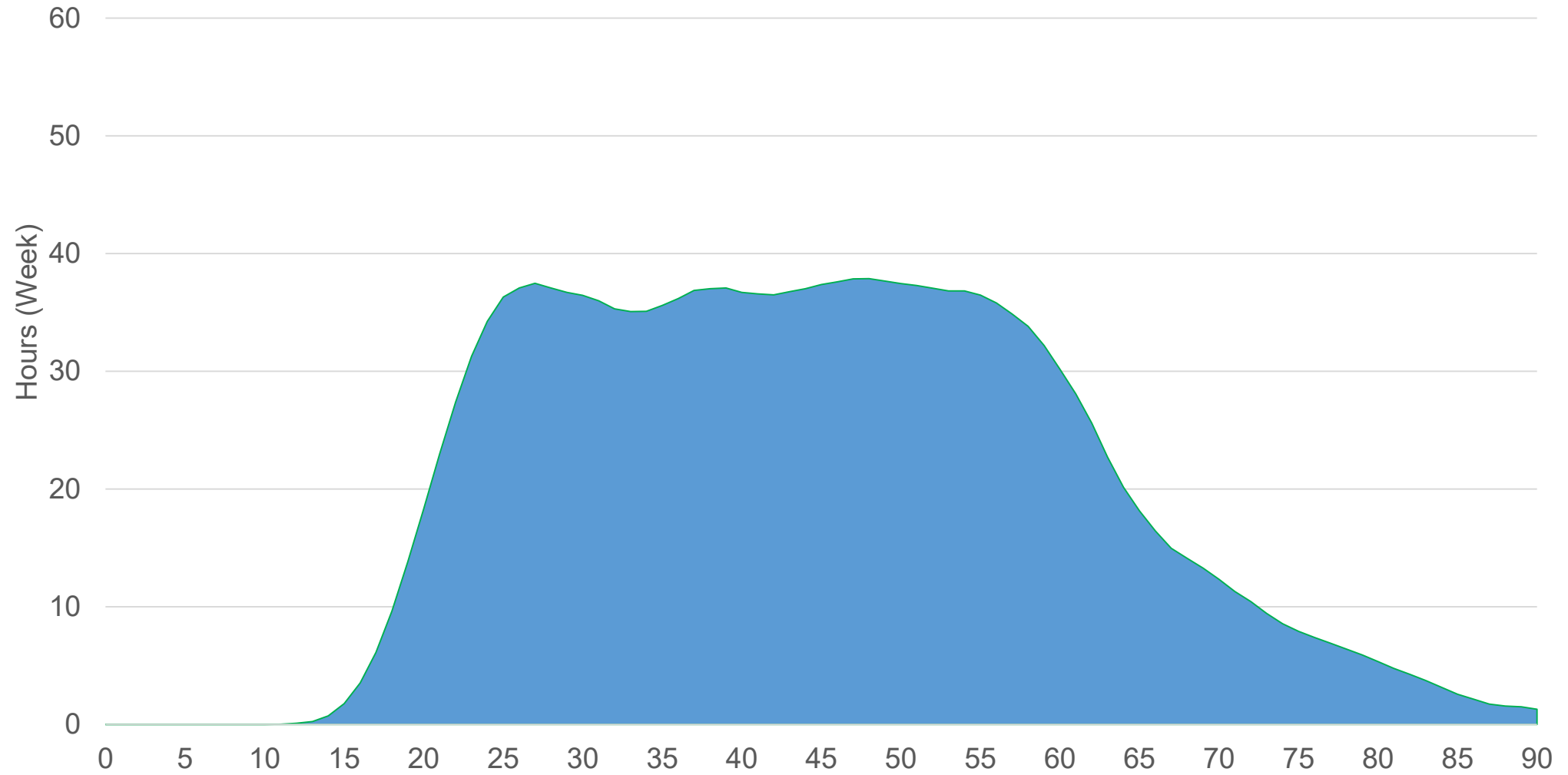


MEASUREMENT OF  
REDUCTION IN  
HOUSEWORK HOURS.

# METHODS

- NTTA
  - Frey and Osborne (2013) Automation score
    - Linking each unpaid work activity with paid occupations
    - Assign the F & O automation scores of paid occupations in the US to each unpaid work activity (21 sub-activities) in TU data
    - Use the automation score as a reduction rate in time use
- <https://dx.doi.org/10.2139/ssrn.4031667>

# JAPAN

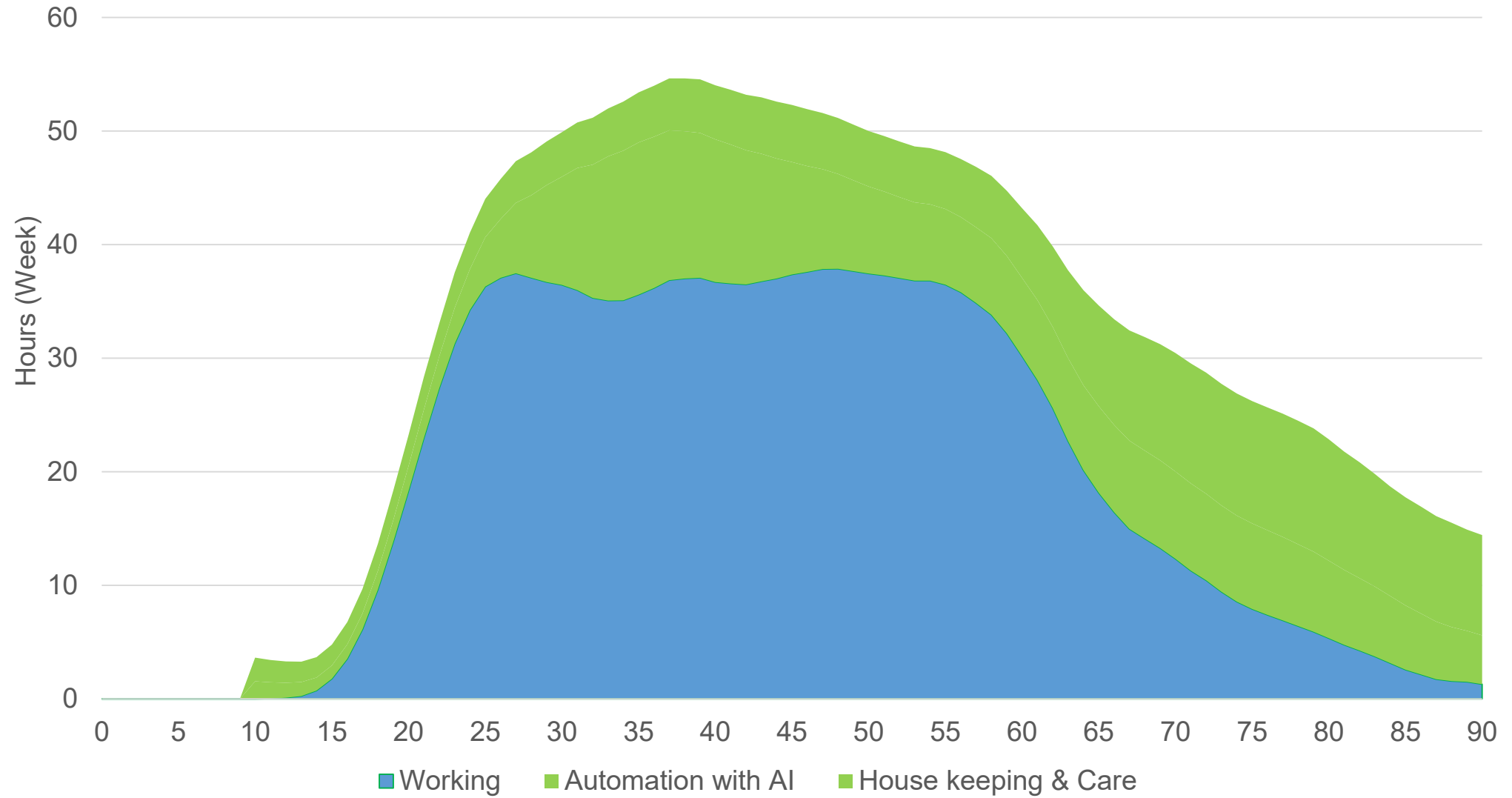


■ Working

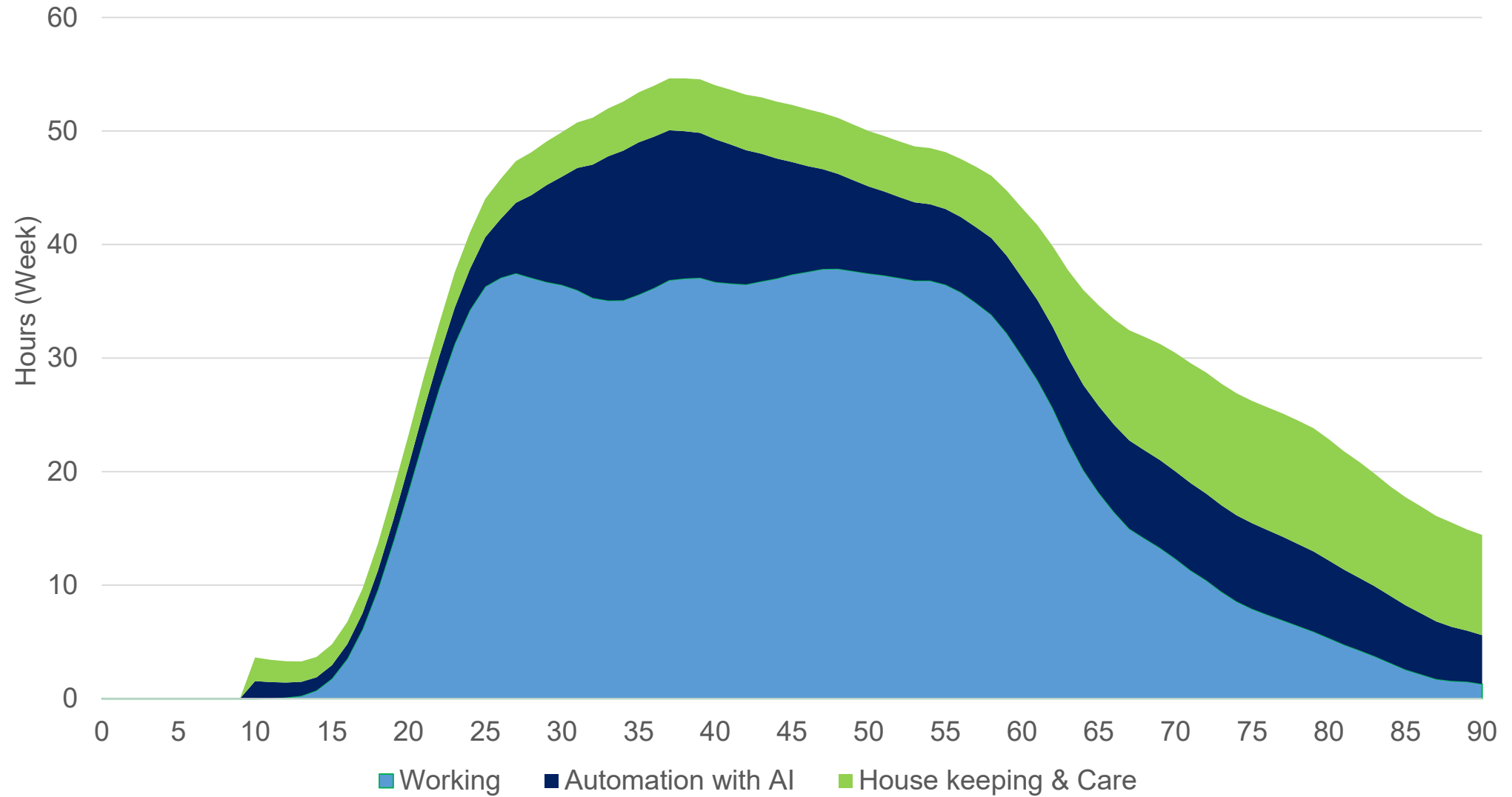
Automation with AI

House keeping & Care

# JAPAN

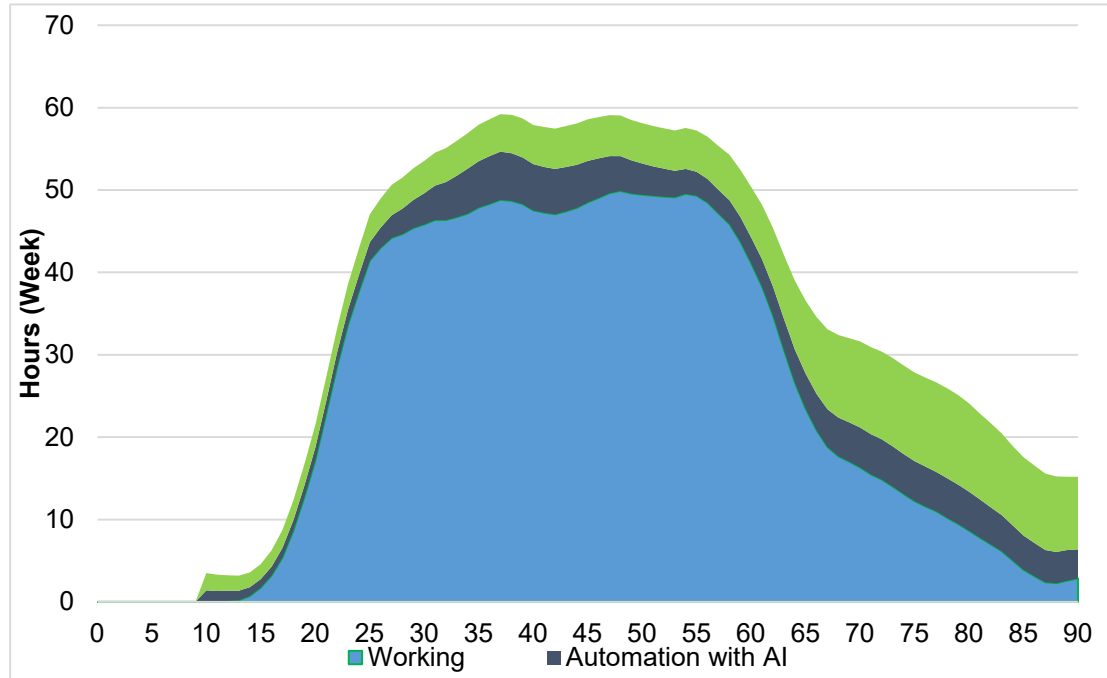


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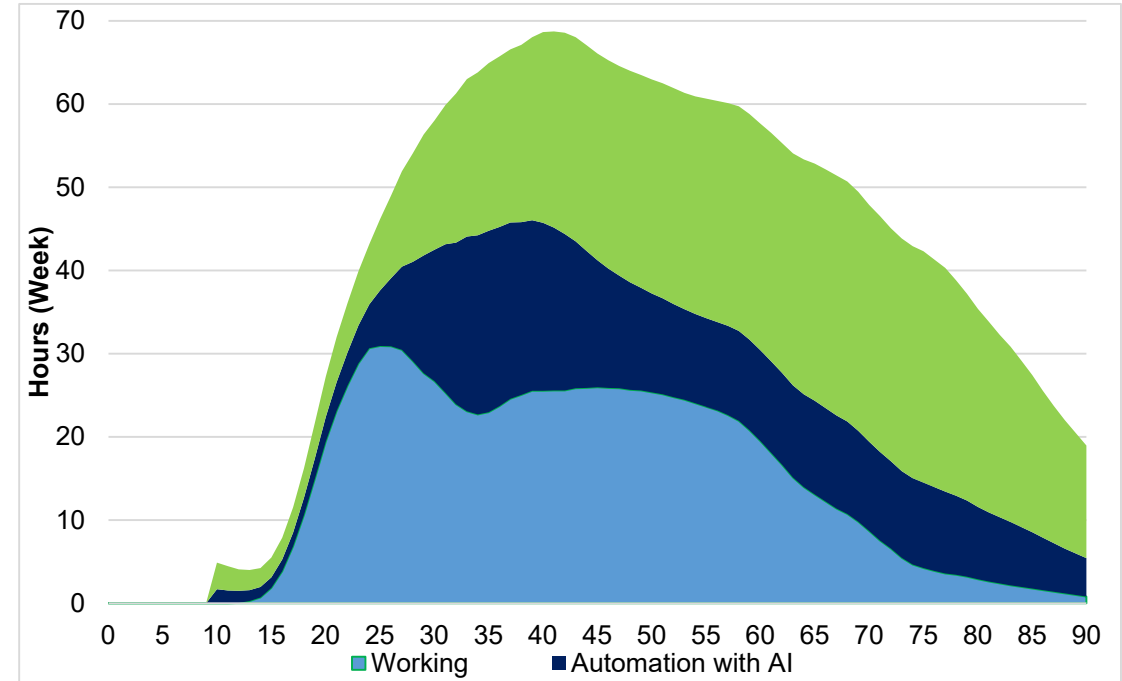


# JAPAN (Working and Houseworking)

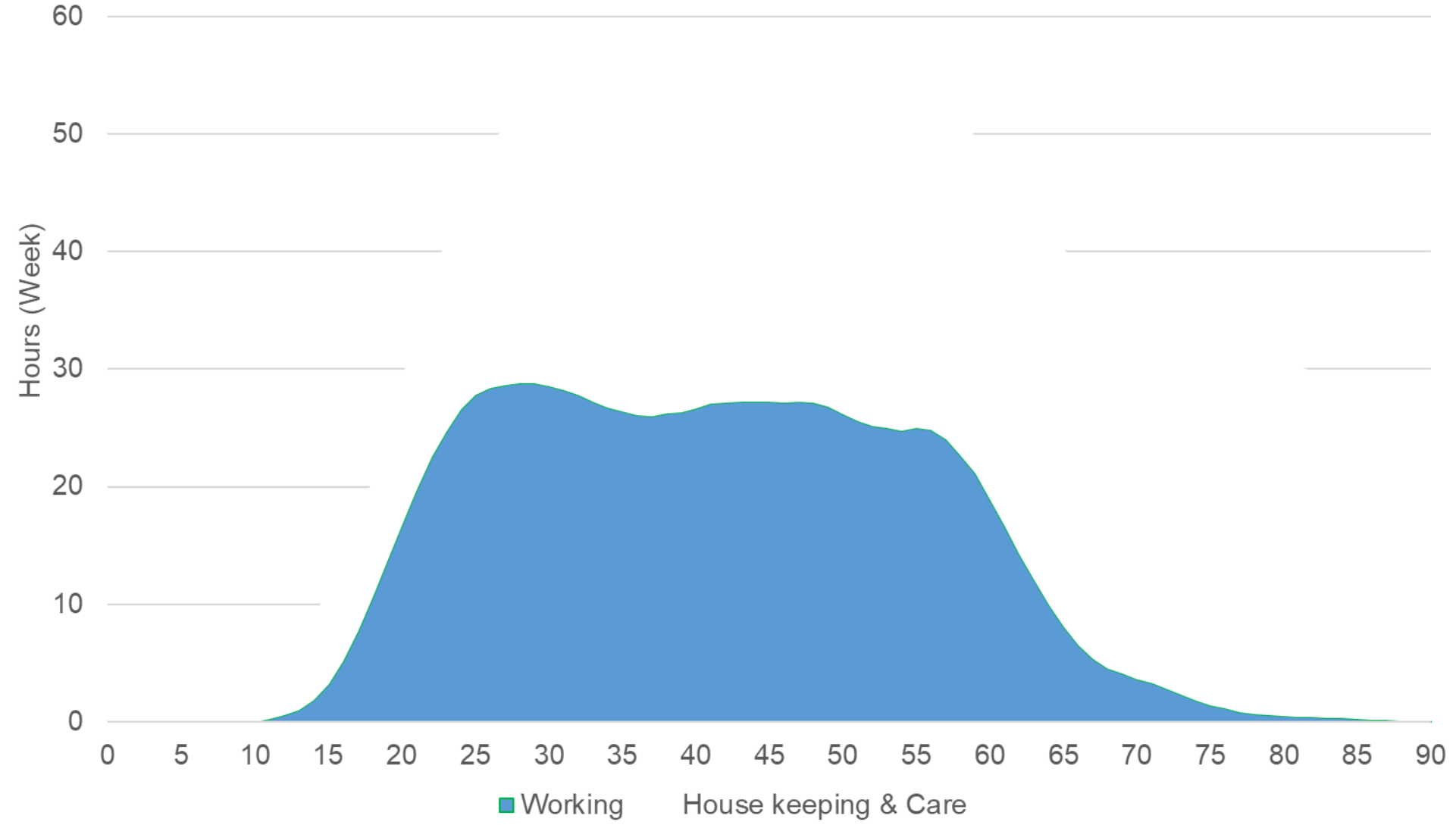
Male



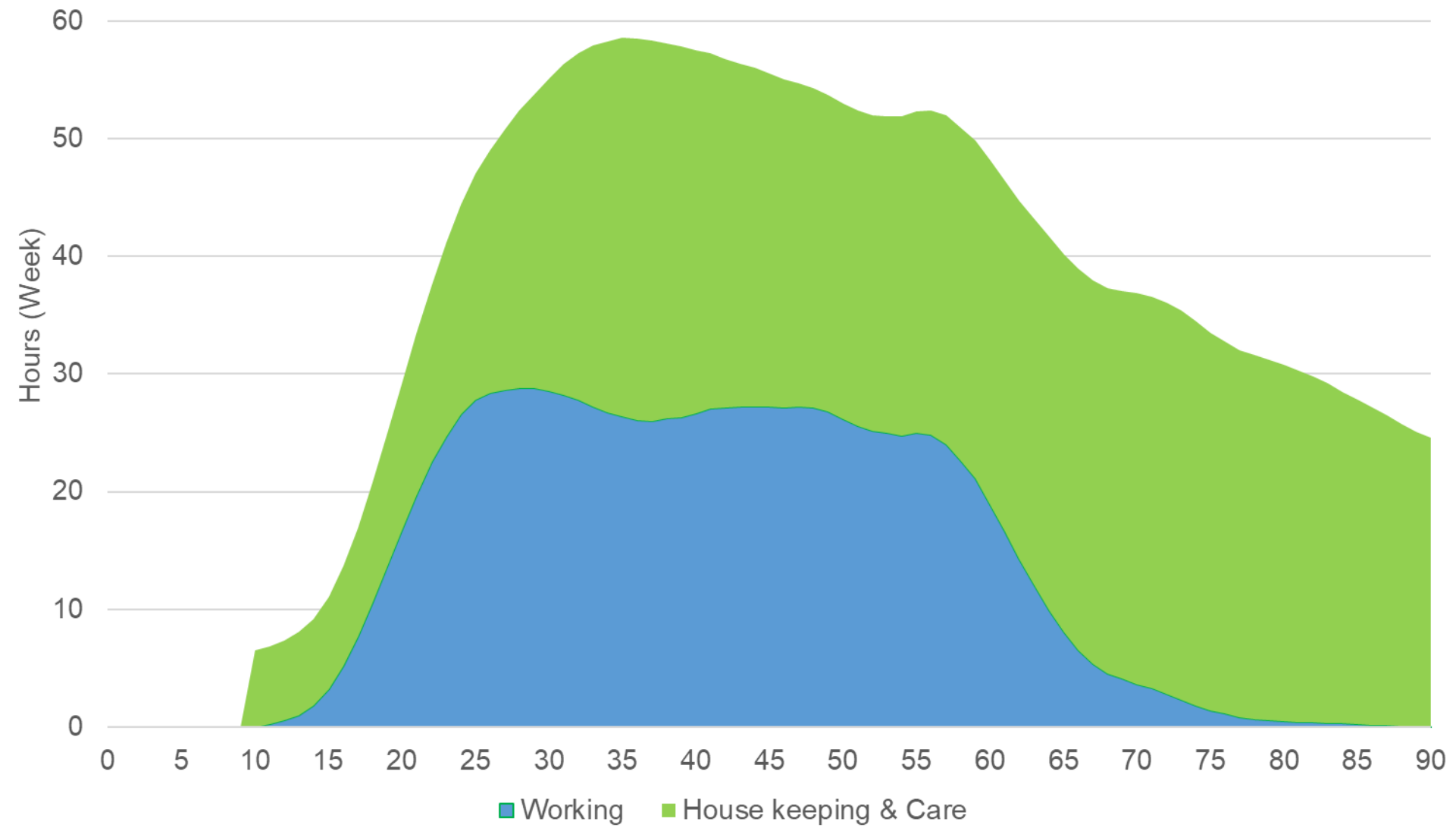
Female



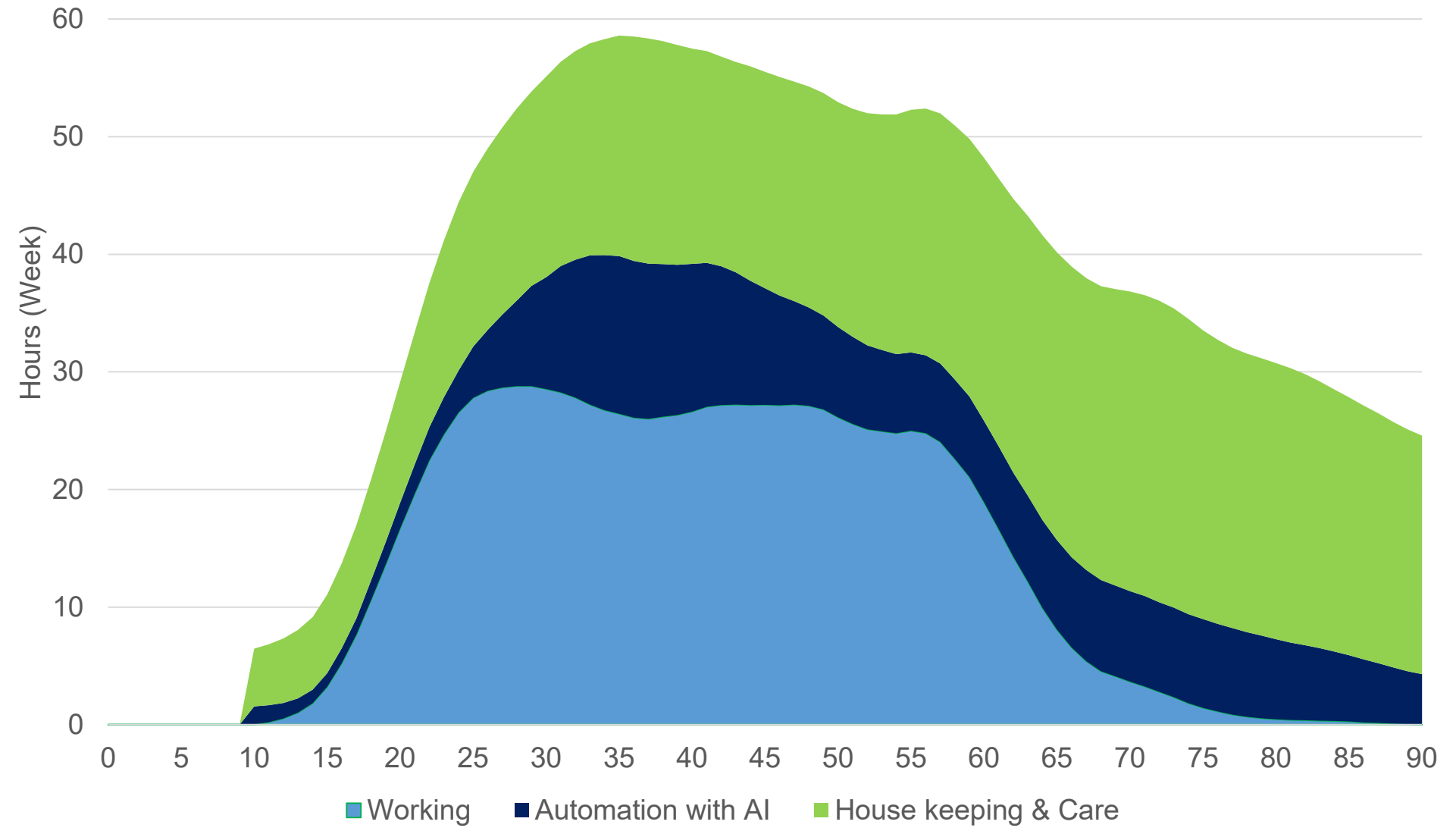
# UK



# UK

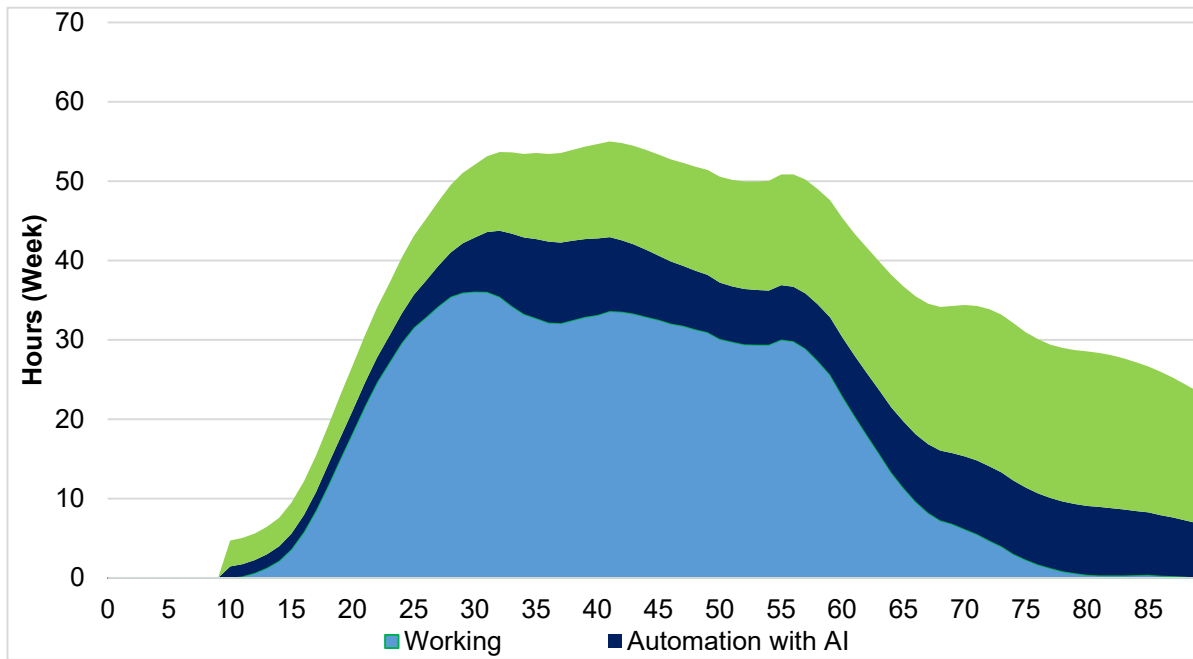


# UK

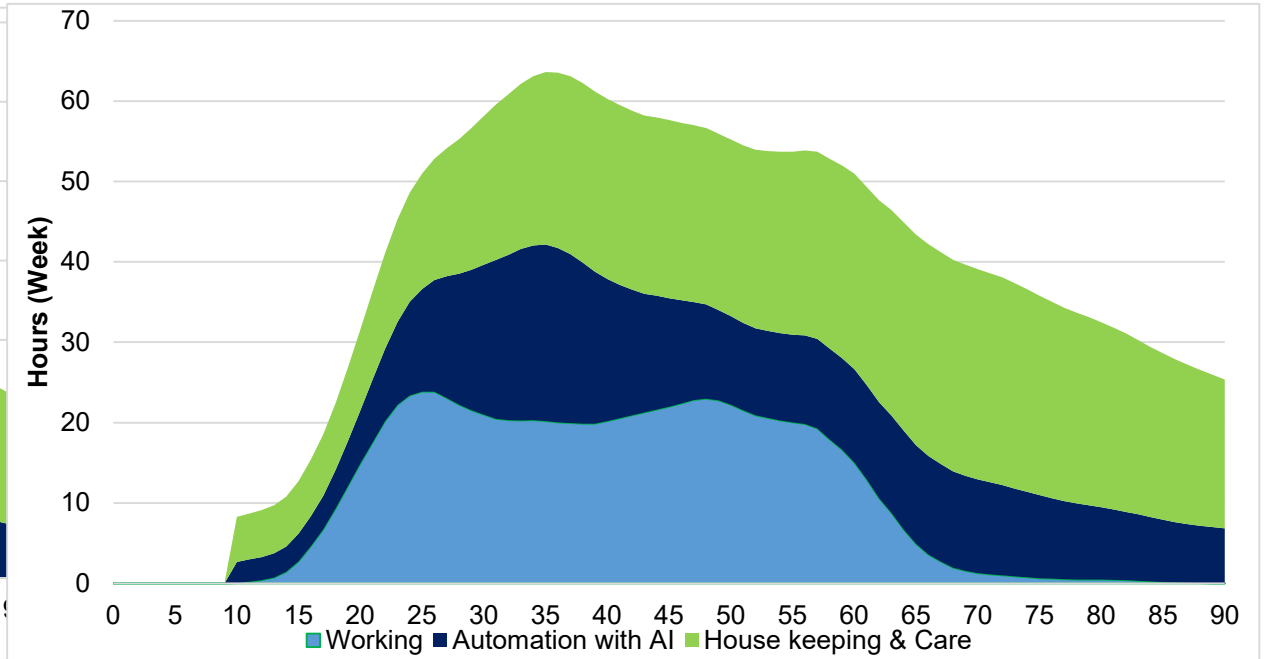


# UK (Working and Houseworking)

Male



Female



WHO BENEFITS FREOM TECHMPLOGY?

The benefits will differ depending on gender, age, type of housework engaged in, whether labor is likely to be replaced by AI etc., and earning ability.

## Weekly housework hours reduced by AI

	(Hours)			
	Japan		UK	
	Male	Female	Male	Female
10-14	1.2	1.5	1.6	2.9
15-19	1.2	1.8	2.3	4.4
20-24	1.8	4.1	3.2	9.2
25-29	2.8	10.3	5.1	15.1
30-34	4.6	19.2	8.3	20.4
35-39	5.8	21.1	10.0	20.8
40-44	5.5	18.5	9.0	15.7
45-49	4.5	13.7	7.6	12.3
50-54	3.4	11.2	7.0	10.9
55-59	2.9	10.7	7.0	11.1
60-64	3.6	11.0	7.8	11.9
65-69	4.6	11.1	8.6	12.1
70-74	4.9	10.5	9.3	11.2
75-79	4.8	9.8	8.9	9.8
80-84	4.5	8.0	8.5	8.5
85-89	4.0	6.0	7.4	7.4
90+	3.5	4.6	6.6	6.8
Total	3.6	10.3	5.9	10.6

Great benefits for the child-rearing generation

There is no country difference in women's time use reductions, but Japanese men are only about half as many as the UK men across all generations.

## AI replacement rate in total housework hours

	(percent)			
	Japan		UK	
	Male	Female	Male	Female
10-14	39	35	33	33
15-19	36	36	34	36
20-24	38	40	33	43
25-29	44	47	39	49
30-34	53	52	46	51
35-39	56	50	47	49
40-44	53	43	42	41
45-49	48	35	37	36
50-54	41	30	34	33
55-59	35	29	33	32
60-64	33	29	33	32
65-69	32	28	33	32
70-74	31	27	32	30
75-79	31	27	31	29
80-84	31	27	31	28
85-89	30	26	30	27
90+	29	25	29	27
<b>Total</b>	<b>40</b>	<b>35</b>	<b>36</b>	<b>38</b>

The replacement rate is also increasing among the child-rearing generation.

Regarding the replacement rate, both Japan and the UK are the same. The point is that Japanese men do not do as much housework as the UK men.

However, it may be important in fertility policy that the generation of Japanese men raising children could also be greatly affected by AI.

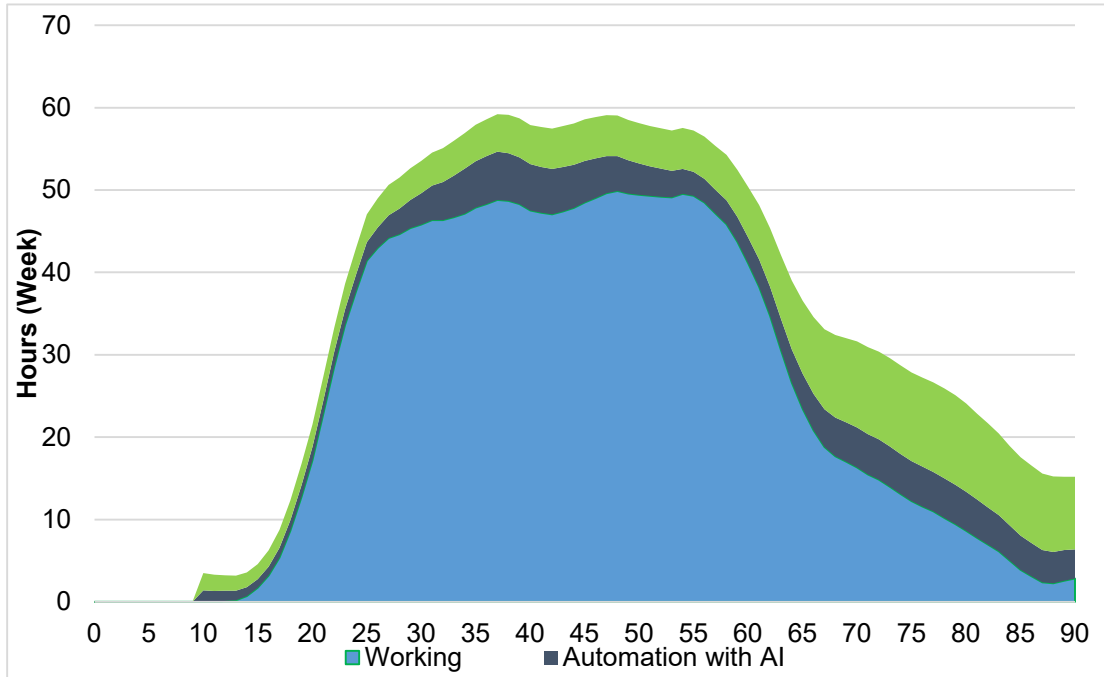
## Economic impacts

Estimated by assuming that the time replaced by AI all became the labor force

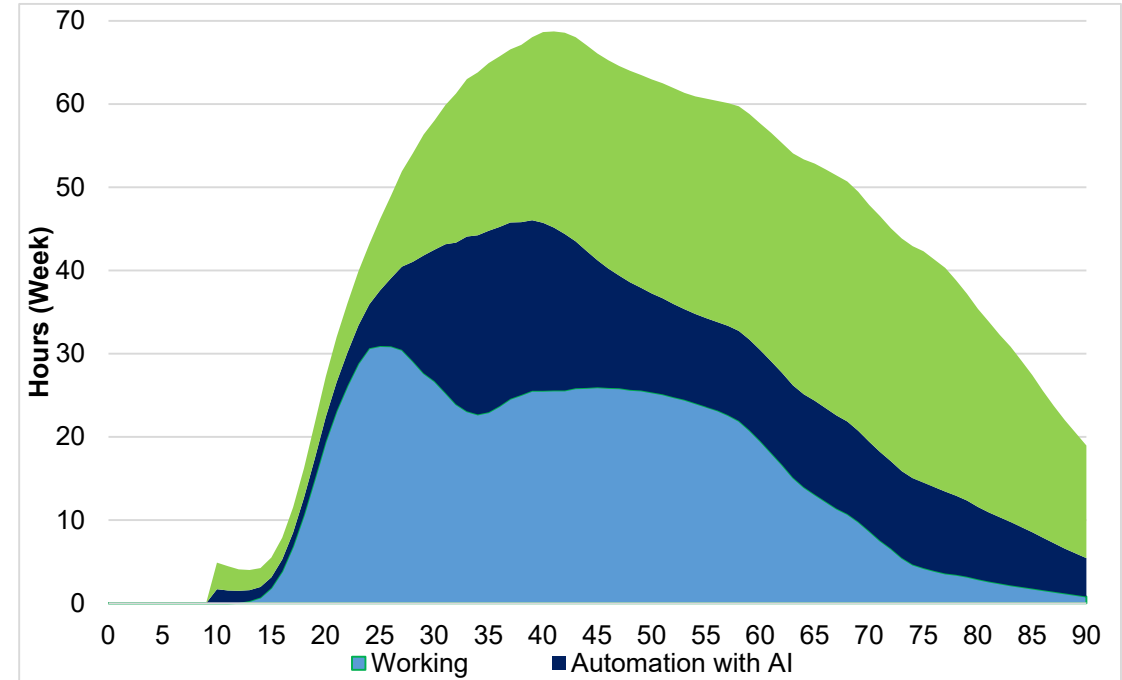
The image looks like this...

# JAPAN: BEFORE

Male

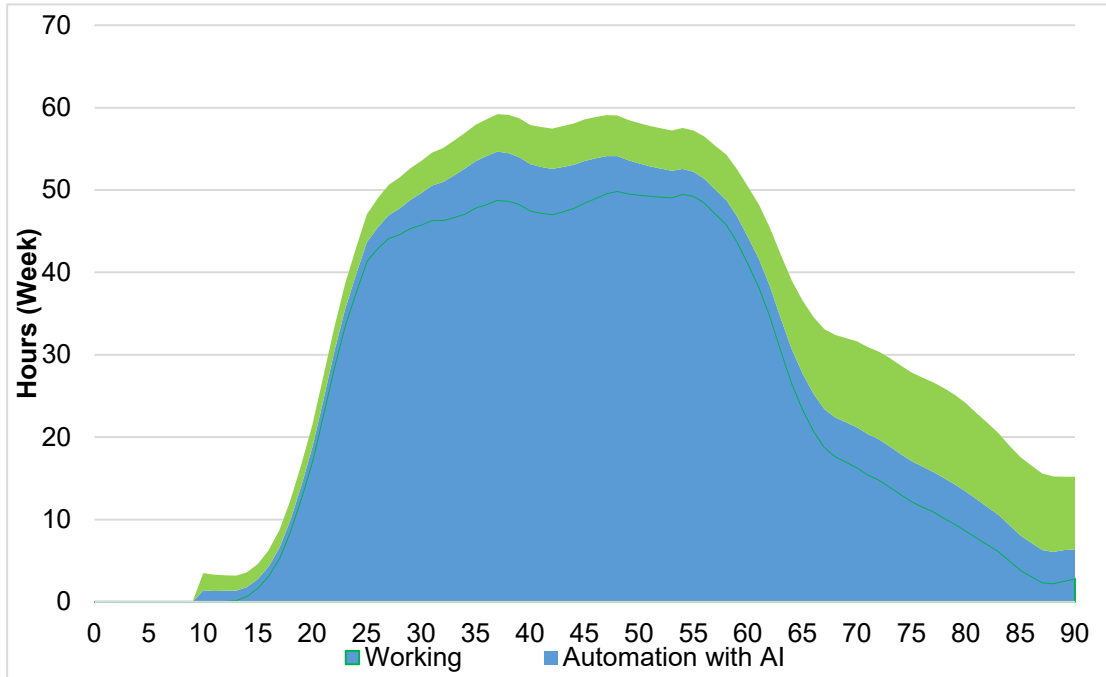


Female

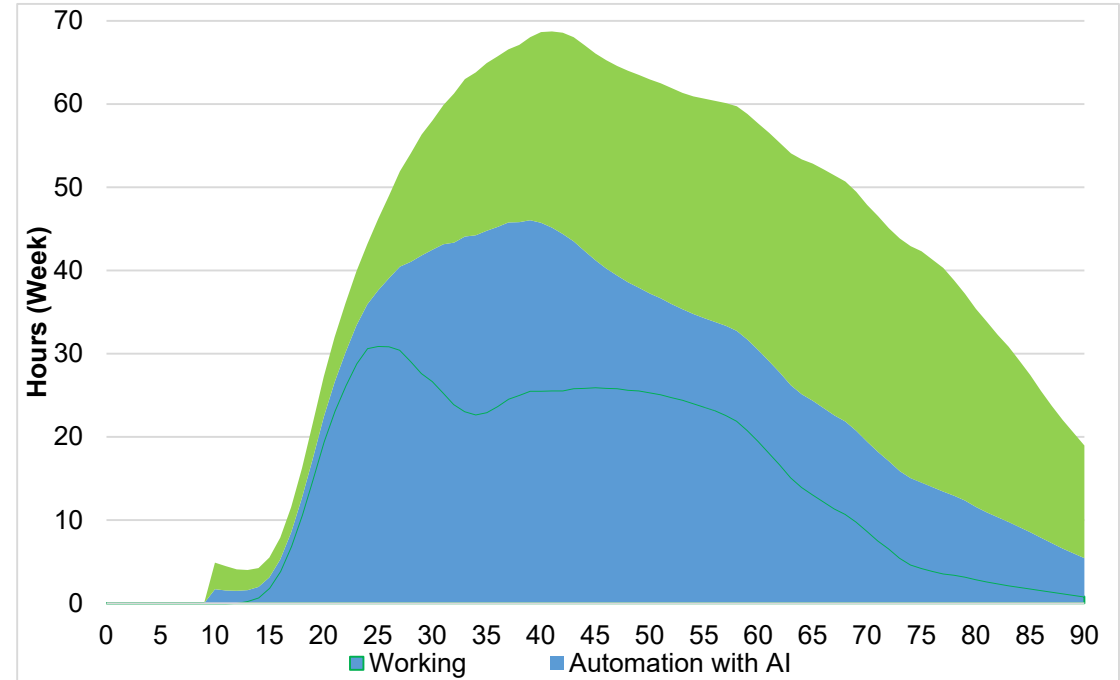


# JAPAN: AFTER

Male

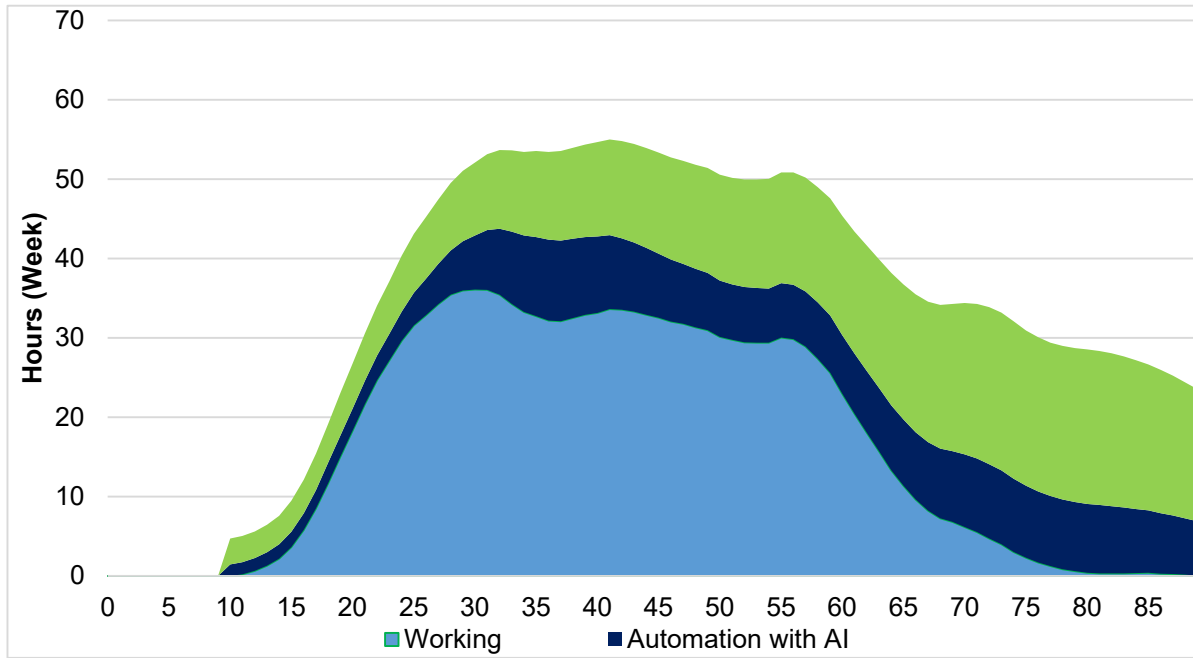


Female

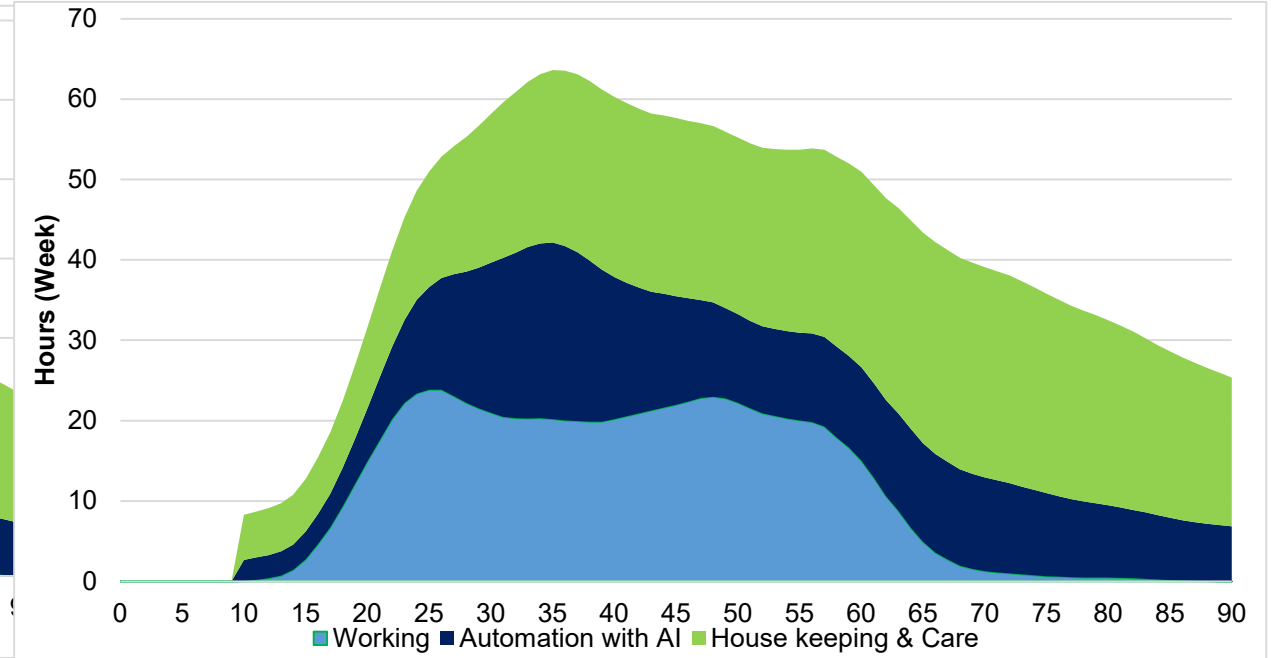


# UK: BEFORE

## Male

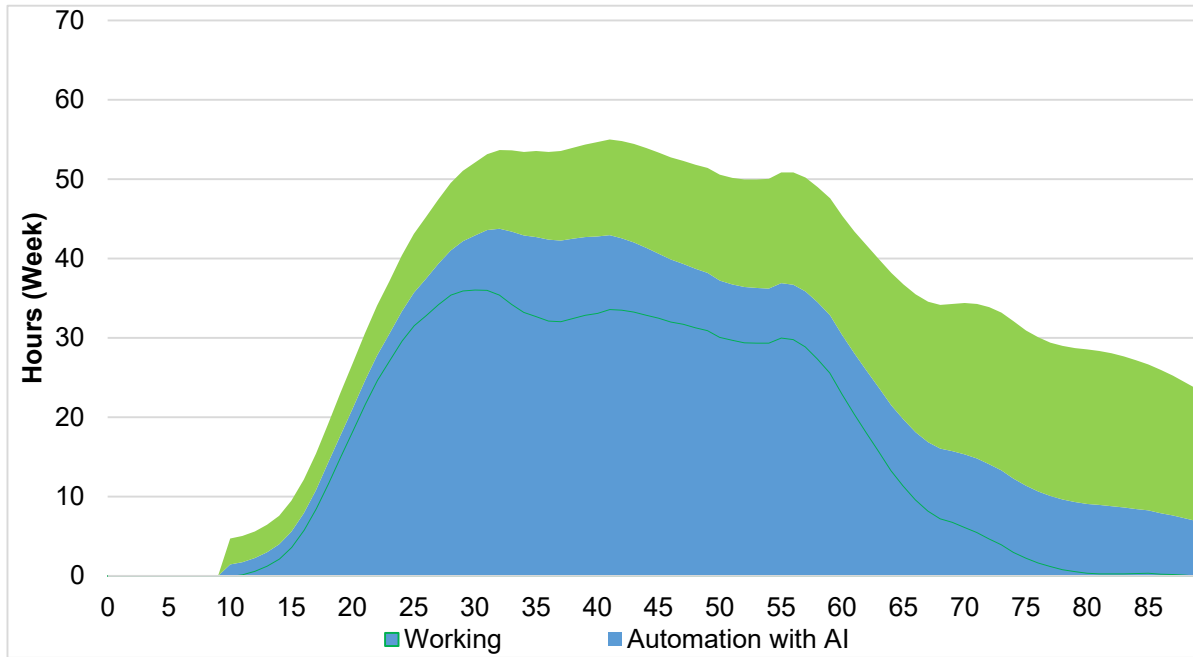


## Female

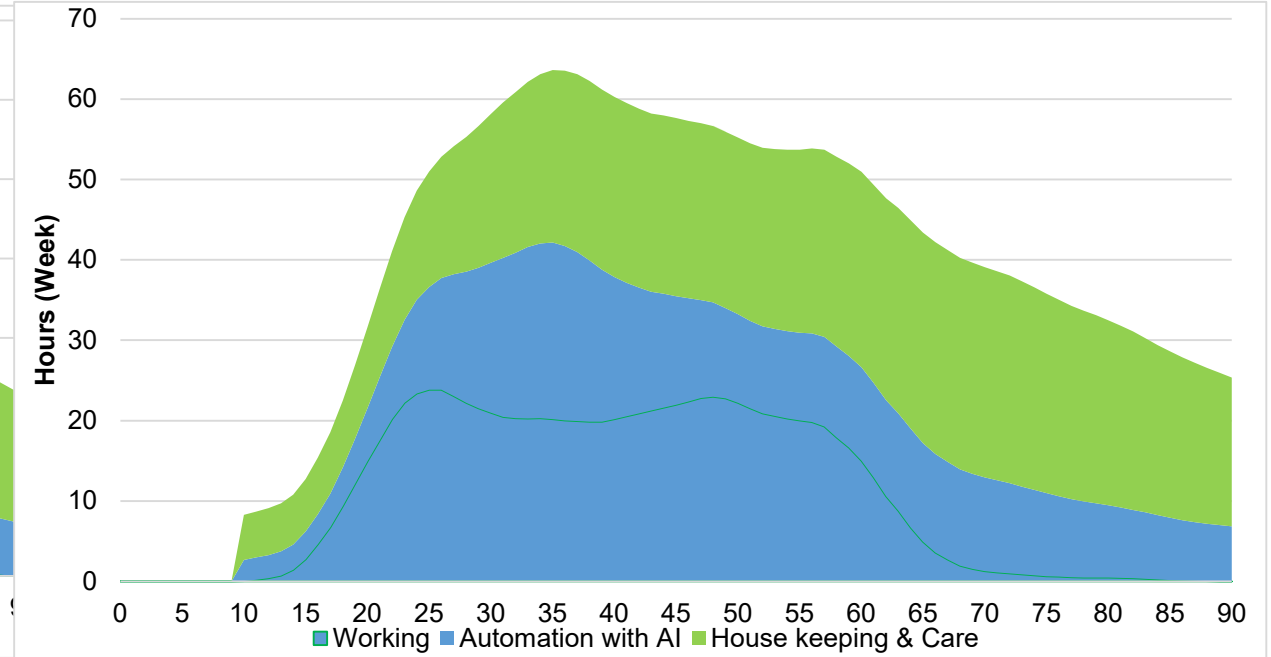


# UK: AFTER

## Male



## Female



## Weekly wage when working leisure time by AI

	Japan(JPY/W)		UK(GBP/W)	
	Male	Female	Male	Female
10-14	1533	1666	17	23
15-19	8273	9801	85	83
20-24	37674	35595	273	272
25-29	69547	54983	498	464
30-34	88049	64939	669	587
35-39	105722	71487	749	626
40-44	115340	71356	797	556
45-49	129407	65086	755	514
50-54	133928	59149	696	458
55-59	119453	51896	640	411
60-64	69996	37905	431	286
65-69	39749	29471	269	177
70-74	31880	22104	217	143
75-79	25781	17557	158	120
80-84	18949	13571	136	104
85-89	11217	9614	118	87
90+	10100	7062	100	78
<b>Total</b>	<b>54218</b>	<b>32690</b>	<b>325</b>	<b>249</b>

The age at which the economic impact is felt differs greatly between Japan and the UK. This is a difference in wage profiles

In both countries, men have a greater economic impact, but in Japan the difference is very large.

In Japan, AI reduces men's housework hours less, but there is an incentive to actively introduce it from the perspective of opportunity cost.

# MACROECONOMIC IMPACT

As before, what is the size of labor income when AI replaces housework?

# AUTOMATED HOUSEWORK DIVIDEND

if tomorrow. Assuming that AI and robots spread rapidly, household work is reduced, and everyone works all the time instead,

Macro labor income : +31% in Japan, +52% in the UK

Since the labor share of national income is about 50% in both countries,

The national income: +15% in Japan, +25% in the UK

# DISCUSSION

Change in technology and change in unpaid working hours is actually quite a difficult debate

Between 1920 and 1960, despite of the spread of useful household appliances, such as washing machine, vacuums, dishwasher etc., unpaid work time use still remains substantial (Schor, 1993).