Media use and trust during the COVID-19 pandemic: evidence from eight cross-sectional surveys in Sweden

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Background: While a lot has been written about Sweden’s COVID-19 control strategy, less is known about Swedish residents’ media use during the pandemic and trust in and perceived agreement among key stakeholders commenting in the media. Methods: Eight online, nationwide surveys were fielded between March and August 2020, during the first wave of the coronavirus pandemic in Sweden, with 8146 responses. Questions were asked on media usage, perceived tone of media, trust in key pandemic stakeholder groups commenting in the media (politicians, journalists, government officials, doctors/healthcare professionals and researchers) and perceived agreement among these key stakeholders about how the pandemic was handled in Sweden. Results: Using five or more information sources was associated with increased perceived alarmism in the media. Women and those with tertiary education were more likely to trust key pandemic actors. Trust in doctors/healthcare professionals and researchers remained high over the course of the study, trust in politicians and journalists was relatively low throughout the study period, with a slight increase in April 2020. Trust in key stakeholders was strongly associated with perceived agreement among the key stakeholders. Conclusions: Our results show that trust in stakeholders was strongly associated with perceived consistency of messages from those stakeholders. The inverse also holds: perceived conflicting messages among stakeholders was associated with low trust in them. Taken together, this could point to the importance of building trust before a crisis. Trust-building efforts could be targeted to men and those with lower educational attainment, as they had lower trust in key stakeholders.

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Framework, the media has the potential to heighten or attenuate the public’s perceptions of risk, which can in turn influence their health behaviors.13

Swedish citizens generally have a high level of trust in government and scientific research.14–16 A national survey that was conducted in 2019 revealed that 79% of the respondents have fairly or very high trust in researchers in universities, a number that has stayed relatively stable since 2011.15 Medicine as an area of study is both of most interest and most trusted among Swedish citizens.15,17 Compared to citizens of other European countries, Swedes also have relatively high trust in their government (62% in Sweden vs. 36% on EU average) and feel that most people can be trusted.14,18

Whereas a lot has been written about the Swedish COVID-19 strategy, little is known about the media use of Swedish citizens and their trust in key stakeholders during the COVID-19 pandemic. Therefore, we aim to investigate the public’s media use, their perception of the tone of the media reporting on the coronavirus, as well as their trust in key stakeholders and their perceived agreement among key stakeholders during the first wave of the coronavirus pandemic in Sweden, between March and August 2020.

Methods

Nationwide online surveys were carried out at eight points in time between March and August 2020, overlapping with the first wave of the coronavirus pandemic in Sweden (see Supplementary table S1). Surveys were administered by the market research company Kantar Sifo, using their online panel. This panel consists of ~100,000 participants who have been randomly recruited through both postal and telephone invitations, based on the unique personal identity numbers of all registered residents in Sweden. Participants were eligible if they were 18 years or older. Every survey had a minimum sample size of 1000 respondents (max. 1141), randomly selected from the panel (Supplementary table S2). Because the entire online panel was eligible for every survey, participants could be included more than once. In practice, 861 participants answered two surveys, 135 took part in three surveys and 41 participated in four surveys or more. The results from each survey were weighted based on age, sex and region to create representative samples.

The data from the eight surveys were pooled, resulting in an overall sample size of 8146 observations. New survey weights were calculated based on age, sex and region and applied to the pooled sample. Three main analyses were carried out:

• The association between the perceived tone of the media and the number of news media outlets used.
• Predictors of trust in five key stakeholder groups.
• The association between trust and perceived agreement within the five key stakeholder groups.

The five key stakeholder groups were: politicians, journalists, government officials (including FHM), doctors/healthcare professionals and researchers.

Not all questions were repeated in every survey, see Supplementary table S1. Questions about the perceived tone of the media, and the number of media sources used were asked in Surveys 1, 3, 5, 7 and 8. The question on the perceived tone of the media (‘Overall, how do you perceive the tone of the Swedish news media’s reporting on the coronavirus?’) was answered with a 5-point Likert scale (‘very cautious’, ‘somewhat cautious’, ‘neither cautious nor alarmist’, ‘somewhat alarmist’ and ‘very alarmist’). This was subsequently categorized into ‘cautious’, ‘neither cautious nor alarmist’ and ‘alarmist’. A score was created for the number of media sources used, based on the question ‘Through which of the following news media have you received information about the coronavirus in the last two days?’, which had a list of 13 traditional news media outlets (radio, TV and newspapers). This was further categorized into 0–2 (44% of responses), 3–4 (39%) and 5–13 sources (16%).

The question ‘What level of trust do you have in the following groups when they comment on the coronavirus in Swedish news media?’ was asked in all eight surveys, with response alternatives on a 5-point Likert scale (‘very low’, ‘somewhat low’, ‘neither low nor high’, ‘somewhat high’ and ‘very high level of trust’). The scale was subsequently categorized into ‘low trust’, ‘neither low nor high’ and ‘high trust’.

The question about the perceived intra-group agreement within the previously listed five key stakeholder groups was asked in survey number 2, 4, 6, 7 and 8 (‘Overall, in how much agreement do you perceive the following Swedish professional groups to be when it comes to dealing with the corona pandemic in Sweden (how do politicians, for example, agree with each other)?’), with a 4-point Likert scale (‘Not at all in agreement’, ‘not quite’, ‘fairly high’ and ‘high level of agreement’). This was dichotomized into ‘no agreement’ and ‘agreement’.

Statistical analysis

Descriptive statistics were calculated, and trends were plotted for:

• The perceived tone of media reporting.
• Number of news media sources used for information on the pandemic.
• Trust in the five key stakeholder groups.
• The perceived agreement among the five key stakeholder groups.

For the analysis of the perceived tone of the media, the associations were estimated with the number of media sources consumed (0–2 sources, 3–5, >5), as well as time (i.e. time point of survey: 1, 3, 5, 7 and 8). Associations were tested between trust in five key groups and demographic covariates: age (continuous), sex (men and women) and education (up to secondary and tertiary). Because the proportional odds assumption was violated, we ran multinomial logistic regression models instead of ordinal logistic regression models, and estimated relative risk ratios (RR) and their 95% confidence intervals (95% CIs). Media usage patterns (i.e. the specific media used) were analyzed for the covariates that were statistically significantly associated with trust in key groups. Lastly, associations were tested between trust and perceived agreement among the key groups using logistic regression to estimate odds ratios and their 95% CIs. All tested models were adjusted for number of survey, age (continuous), sex (men and women), and educational attainment (up to secondary and tertiary) and survey weights. Analyses were carried out in Stata MP15 and SPSS 25. Ethical permission was sought at the Swedish Ethical Review Authority in Stockholm, who deemed ethical permission not necessary for the study (2021-01537).

Results

Pooling the data of the eight surveys resulted in an overall sample size of 8146 observations. The sample was evenly distributed between men and women, see Supplementary table S3. The largest age group was those aged between 30 and 49 years (32%). The majority (60%) had completed tertiary education, 36% attained secondary education and 4% completed primary education only.

Perceived tone of the media

In the first survey, 70% of respondents perceived the tone of the media reporting on the coronavirus to be alarmist, decreasing to 32% in Survey 8 (see figure 1 — hospital admissions were added to the figure to provide a background of the curve of the first wave of the pandemic in Sweden). At the same time, the share of respondents perceiving the tone as cautious increased from 6% in Survey 1 to 17% in Survey 8. In March (Survey 1), the majority of respondents (66%)
used at least three news media outlets as sources of information (see Supplementary figure S1). This share decreased over time, and in the last survey the majority used 0–2 sources (56%).

Multinomial logistic regression models showed that using at least five sources of information was associated with an increased likelihood of perceiving the tone of the media to be alarmist (RR 1.6, 95% CI 1.3–1.9) compared to those exposed to 0–2 sources, see table 1. Compared to those with primary and secondary education, respondents with tertiary education were more likely to have high trust in all five stakeholder groups (e.g. government authorities RR 1.7, 95% CI 1.5–1.9). Further analysis of the media usage patterns of those aged 65 and older shows that they on average consumed less tabloid media and more morning newspapers, public service radio and television than the general population (see Supplementary table S4).

Table 1 Association between number of news media outlets used for information on the pandemic and the perceived tone of media

| No. of sources | Cautious vs. neither | Alarmist vs. neither |
|---------------|----------------------|----------------------|
|               | Adjusted* RR (95% CI) | P-value | Adjusted* RR (95% CI) | P-value |
| 0–2           | Reference – Reference | 0       | 0.96 (0.78–1.19) | 0.703 | 1.06 (0.92–1.22) | 0.427 |
| 3–4           | 1.13 (0.85–1.51) | 0.200 | 1.58 (1.31–1.91) | 0.000 |
| 5–13          | Reference – Reference | 0       | 0.94 (0.65–1.36) | 0.758 | 0.40 (0.33–0.48) | 0.000 |
| Survey 1      | 0.94 (0.65–1.36) | 0.758 | 0.40 (0.33–0.48) | 0.000 |
| 2             | 1.41 (0.99–1.99) | 0.055 | 0.35 (0.28–0.42) | 0.000 |
| 3             | 1.23 (0.87–1.73) | 0.239 | 0.22 (0.18–0.28) | 0.000 |
| 4             | 1.48 (1.06–2.08) | 0.022 | 0.23 (0.19–0.28) | 0.000 |

Sample size for analysis: N = 4943.

a: Adjusted for: sex, age, education and survey weights.

Trust and perceived agreement within key stakeholder groups

Overall, for all stakeholder groups, their perceived intra-group agreement on the handling of the pandemic decreased slightly over time, most notably for researchers (77% in Survey 1 to 57% in Survey 8), see Supplementary figure S3. Doctors/healthcare professionals had the highest perceived agreement, both at the start (89% in Survey 1) and at the end of the study period (81% in Survey 8).

The analyses of the associations between trust in key groups and the perceived agreement in those key groups revealed a clear pattern; low levels of trust were associated with low perceived agreement [e.g. politicians adjusted odds ratio (AOR) 0.4, 95% CI 0.3–0.4], see table 3. Similarly, high levels of trust were associated with high levels of perceived agreement for all five key groups (e.g. doctors/healthcare professionals AOR 8.6, 95% CI 6.6–11.2).

Discussion

Media play a key role in infectious disease outbreaks. In our study of eight surveys during the first wave of the coronavirus pandemic in Sweden, we find that almost half of the respondents used five or more news media outlets as sources of information about the coronavirus in March 2020. Given the novelty of both the virus and the pandemic threat, increased media consumption has been reported in many affected countries. Our finding that perceived alarmism in the media decreased during the first wave is to some extent corroborated by a content analysis on Swedish media articles about research and the corona virus, showing that the proportion of articles with an alarming tone was higher in April and May 2020 than later in the...
Interestingly, our results show that perceived alarmism was associated with increased use of media. Increased media consumption can potentially have positive effects on people’s behavior, e.g. by increasing the likelihood for the public to adhere to public health guidance. At the same time, feelings of distress caused by increased media consumption could hamper the uptake of protective practices. We did not ask whether the tone of the media coverage was perceived to be appropriate or warranted. Future studies could

| Table 2 Associations between demographic characteristics and trust in key stakeholder groups |
|---------------------------------------------------------------|
| Politicians | Journalists | Government officials | Doctors/healthcare professional | Researchers |
| Adjusted RR (95% CI) | Adjusted RR (95% CI) | Adjusted RR (95% CI) | Adjusted RR (95% CI) | Adjusted RR (95% CI) |
| Age | Fairly/very low trust vs. neither | 0.99 (0.99–1.00)*** | 0.99 (0.99–0.99)*** | 0.99 (0.97–0.99)*** | 0.99 (0.98–1.00) |
| Sex | Men | Reference | Reference | Reference | Reference |
| Women | 0.64 (0.57–0.72)*** | 0.67 (0.62–0.74)*** | 0.56 (0.47–0.66)*** | 0.83 (0.56–1.23) | 0.58 (0.43–0.79)*** |
| Education | Primary/secondary | 0.87 (0.78–0.97)* | 0.88 (0.79–0.97)† | 1.17 (1.00–1.38)† | Reference |
| Tertiary | 1.01 (1.00–1.01)† | 1.00 (0.99–1.00)† | 1.02 (1.00–1.04)† | 0.91 (0.83–1.34) | 1.10 (0.82–1.47) |
| Age | Fairly/very high trust vs. neither | 0.98 (0.99–1.00) | 0.99 (0.99–1.00)*** | 0.98 (0.99–1.00)*** | 1.01 (1.00–1.01)† |
| Sex | Men | Reference | Reference | Reference | Reference |
| Women | 1.32 (1.18–1.47)*** | 0.96 (0.85–1.09) | 1.26 (1.12–1.42)*** | 1.66 (1.38–2.00)*** | 1.35 (1.17–1.56)*** |
| Education | Primary/secondary | Reference | Reference | Reference | Reference |
| Tertiary | 1.18 (1.05–1.32)** | 1.19 (1.04–1.35)* | 1.69 (1.50–1.90)*** | 1.29 (1.07–1.59)** | 1.56 (1.35–1.80)*** |

Adjusted for: survey weights, sex, age, education, survey and all other covariates in the table.
Sample sizes: politicians n = 7981, journalists n = 7962, government officials n = 8001, doctors/healthcare professionals n = 8044 and researchers n = 8024.
RR, relative risk ratio; 95% CI, 95% confidence interval.
*: P < 0.05, **: P < 0.01, ***: P < 0.001.

| Table 3 Association between trust in key stakeholder groups and perceived agreement |
|---------------------------------------------------------------|
| Politicians | Journalists | Government officials | Doctors/healthcare professionals | Researchers |
| Trust | Low | 0.34 (0.29–0.39) | 0.000 | 0.35 (0.30–0.41) | 0.000 |
| Neither low nor high | 3.10 (2.64–3.64) | 0.000 | 3.02 (2.57–3.55) | 0.000 |
| High | 0.34 (0.29–0.39) | 0.000 | 0.33 (0.29–0.39) | 0.000 |
| Journalists | Trust | Low | 0.34 (0.29–0.39) | 0.000 | 0.34 (0.29–0.39) | 0.000 |
| Neither low nor high | 2.96 (2.47–3.55) | 0.000 | 3.01 (2.51–3.62) | 0.000 |
| High | 2.30 (2.64–3.04) | 0.000 | 2.31 (2.05–2.60) | 0.000 |
| Government officials | Trust | Low | 0.34 (0.28–0.43) | 0.000 | 0.34 (0.27–0.43) | 0.000 |
| Neither low nor high | 7.16 (5.90–8.70) | 0.000 | 6.91 (5.68–8.41) | 0.000 |
| High | 0.47 (0.28–0.80) | 0.005 | 0.44 (0.25–0.76) | 0.003 |
| Doctors/healthcare professionals | Trust | Low | 0.47 (0.28–0.80) | 0.005 | 0.44 (0.25–0.76) | 0.003 |
| Neither low nor high | 8.68 (6.75–11.17) | 0.000 | 8.57 (6.57–11.16) | 0.000 |
| Researcher | Trust | Low | 0.33 (0.18–0.61) | 0.000 | 0.36 (0.19–0.68) | 0.002 |
| Neither low nor high | 7.98 (6.46–9.85) | 0.000 | 8.51 (6.85–10.58) | 0.000 |

Outcome: no/little perceived agreement vs. some/a lot of perceived agreement.
Sample sizes: politicians n = 4579, journalists n = 4289, government officials n = 4675, doctors/healthcare professionals n = 4747 and researchers n = 4651.
a: Adjusted for: sex, age, education, survey weights and survey.
OR, odds ratio; 95% CI, 95% confidence interval.
explore associations between practices, perceived appropriateness of media tone and media consumption; both in terms of the quantity and quality of media usage.

Trust in politicians, journalists and government officials increased in April, but then went back to baseline levels or slightly lower in subsequent surveys, especially for politicians. A survey study in Denmark and Sweden that took place in March, April and June 2020 found that trust in government and health authorities decreased slightly within that time frame. Another large web-survey on a self-selected group of Swedes found an increase in institutional trust between February and March 2020, in line with the increase, we observed at the start of the pandemic. This could be a ‘rally-round-the-flag’ effect, whereby support for governments tends to increase in times of crisis. A similar trend was observed in Germany between April and November 2020. However, as the pandemic continued beyond the period captured in this study, trust in Swedish institutions decreased, suggesting that this effect might not be long-lived. For instance, trust in FHM decreased by 16% points between the spring of 2020 and the spring of 2021. Trust in doctors/healthcare workers and researchers appears to have stayed stable at a very high level after the first wave.

We observed strong associations between level of trust and perceived agreement within key stakeholder groups when they commented in the media. Perceived disagreement within key groups can affect public trust in them, according to the trust determination model. In an experimental study testing the effect of disagreement among experts on laypeople’s trust in experts, perceived disagreement was found to decrease trust in these experts. In our study, the observed decrease in trust in researchers coincided with the appearance of critical voices of 22 researchers in the media. However, given the cross-sectional nature of our data, we cannot establish whether perceived agreement influenced trust in key actors or the other way around. Nevertheless, it is plausible that the level of trust before the pandemic strongly influenced the level of trust during the pandemic and during the course of the study.

The strong associations for both low and high trust with perceived agreement also points to the importance of building trust between the general public and key groups before emergencies arise. Perceived agreement and trust can in turn influence risk perceptions: in the previously mentioned experimental study on expert disagreement and trust, it was also found that perceived disagreement decreased the perceived risk of a threat. The Social Amplification of Risk Framework states that social and cultural processes, such as the media, can heighten or attenuate the risk perceptions of the public. It can therefore be argued that expert disagreements that play out in the media might have amplified or attenuated the perceived risk and trust of the public, which in turn could have influenced health protecting behaviors. Taken together, trust in various actors is a key component for pandemic response and should be actively worked on in the preparedness phase. From our findings, trust in Swedish key stakeholders is lacking especially among men and those with lower educational levels. These groups should therefore be given larger focus in potential future trust-building initiatives.

Conclusions

Whereas the Swedish strategy to handle the COVID-19 pandemic was subject to international scrutiny, public trust in several key stakeholders remained relatively stable during the first wave of the pandemic in Sweden. Trust in key stakeholders goes hand-in-hand with the perceived consistency of messages from those stakeholders, whereby low trust was strongly associated with low perceived agreement and the other way around. Taken together, it points to the need to build and maintain trust before a crisis emerges. Men and those with lower educational attainment were less likely to trust key stakeholders, trust-building efforts could therefore be targeted to them.

Supplementary data

Supplementary data are available at EURPUB online.

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Conflicts of interest: None declared.

Data availability statement

The data underlying this article will be shared on reasonable request to the corresponding author.

Key points

- Public trust in several key stakeholders remained relatively stable during the first wave of the pandemic in Sweden.
- Trust in key pandemic stakeholders was strongly associated with perceived agreement of those stakeholders.
- Men and having lower educational attainment were associated with lower levels of trust in stakeholders and could therefore be targeted for trust-building interventions.

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