WARNING THE PUBLIC:

A SURVEY ON ATTITUDES, EXPECTATIONS AND USE OF MOBILE CRISIS APPS IN GERMANY

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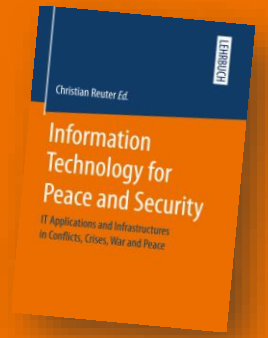

Who's behind it?

Warning the Public: A Survey on Attitudes, Expectations and Use of Mobile Crisis Apps in Germany

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1. Introduction

Crisis Apps in Emergencies

- Crisis and warning apps are used during several disaster stages: pre-disaster, **warning, threat, impact, inventory, rescue, remedy**, recovery (Palen & Liu 2007; Kaufhold et al. 2018)
- Apps can be used to **warn, advice, decide the allocation of ressources, coordinate** (Tan et al. 2017)
- To **engage** citizens as volunteers and witnesses
- Information functionality prevails in apps; communication and preparation functions are less widely spread (Groneberg et al., 2017)
- Emergency Services (ES) act mainly as **broadcasters of information** (Meijer & Thaens 2013), but interested in **bidirectional communication** (Appleby-Arnold et al. 2019)
- Different crisis cultures exist in different countries (Reuter et al. 2019)
- Low motivation to keep infrequently used apps, thus need to explore how to enhance relevant use cases, e.g. **by including crime-related warnings**.

1. Introduction

The Use of Warning Apps in Emergencies

- **Structured workshop** with **civil protection personnel** (N=12) and **German federal police officers** (N=15), open coding revealed practitioners‘ uncertainty about:
  - Citizens‘ experiences with warning apps in emergencies
  - Citizens‘ requirements for warning apps

Results of the workshop

Representative Survey in Germany (N= 1,219)

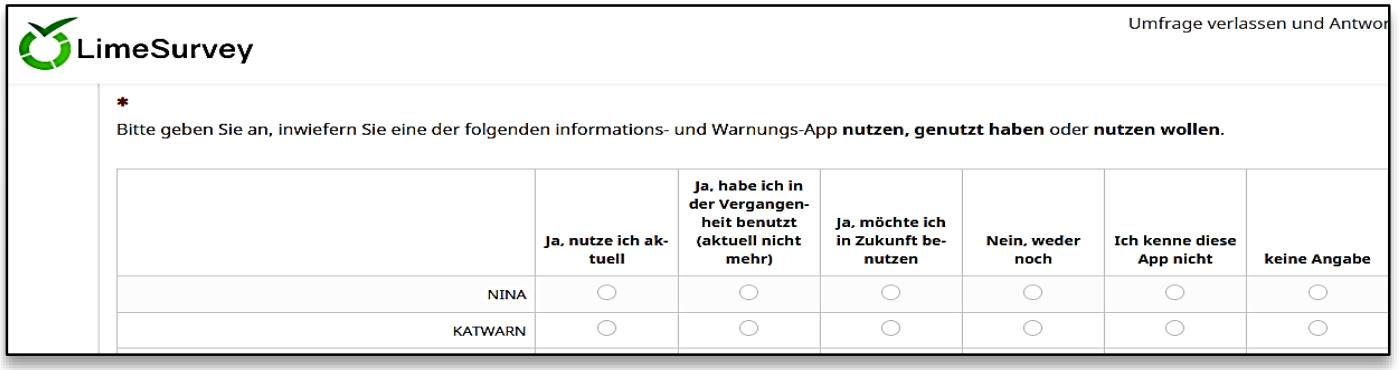
- **7 questions + socio-demographics**
- Finalized questionnaire self-hosted (LimeSurvey), participant recruitment through ISO-certificated panel provider (GapFish), **representative in age, gender, geography, urbanization and education**
- Followed **guidelines for valid item design** and questions are either on **a 5-point interval Likert scale** or **categorical**
- Depending on the variables‘ scales: t-Tests, chi square tests, Pearson’s Phi, Cramer’s V, Kendall’s tau-b, ANOVA and Pearson’s r used
- We **compared survey results** with a similar study from **2017** (N=1,069)

2. Related Work & Research Gap

Research Questions

- RQ1: What is the citizens' past, current and expected future **use** and the perceived **helpfulness** of crisis apps in comparison to other media channels?
- RQ2: What are citizens' **preferences** on the deployment as well as the information and warning behaviour of crisis apps?
- RQ3: What are citizens' demands on **configurability**, required and most important **functionality** of crisis apps?

-> more relevant for practitioners, please refer to the paper



LimeSurvey

Umfrage verlassen und Antwor

*

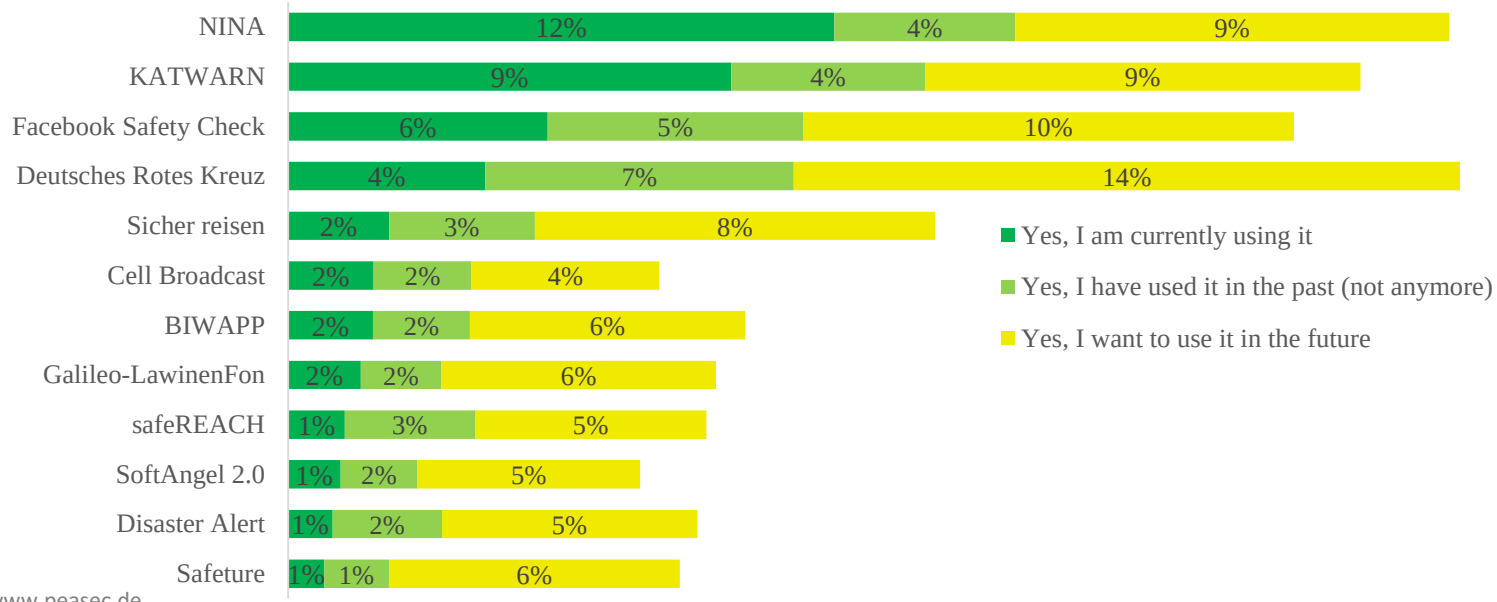
Bitte geben Sie an, inwiefern Sie eine der folgenden informations- und Warnungs-App **nutzen, genutzt haben** oder **nutzen wollen**.

	Ja, nutze ich aktuell	Ja, habe ich in der Vergangenheit benutzt (aktuell nicht mehr)	Ja, möchte ich in Zukunft benutzen	Nein, weder noch	Ich kenne diese App nicht	keine Angabe
NINA	○	○	○	○	○	○
KATWARN	○	○	○	○	○	○

4. Results

Limited Awareness and Limited Use of Crisis Apps

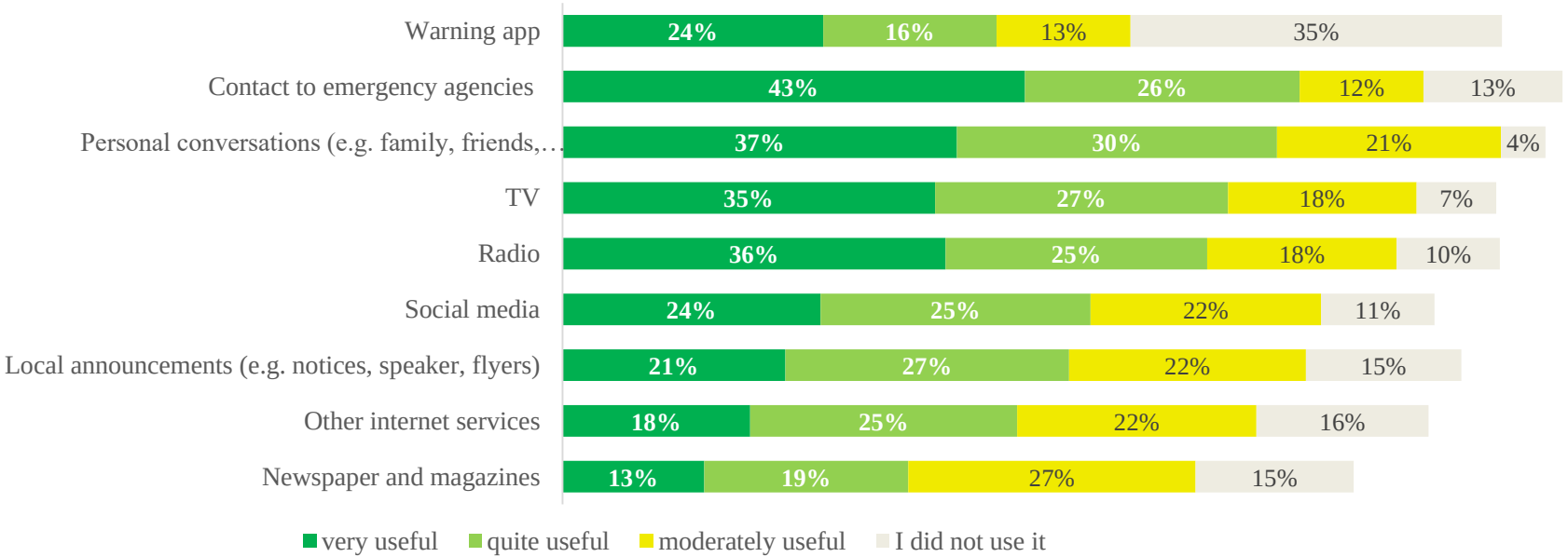
- Limited awareness of existence of warning apps (18%-52%)
- 16,5% of Germans currently use any app
- 26% have current or previous experience with a crisis app
- Current use increased between 2017 und 2019, e.g. NINA (4% to 12%) and KATWARN (6% to 9%), so did planned future use



4. Results

Helpfulness of Sources in Emergencies

- Overall, contact to emergency services and personal conversations are most helpful and crisis apps rated less well
- Looking only at those who had used the corresponding sources in emergencies:
  - 63% rate crisis apps as rather or very helpful - **better than social media and other online sources**.



4. Results

3 Preference Groups for Media Types

- **Group 1:** Prefers privileged authoritative information through local announcements and warning apps
  - Crisis app users prefer direct contact with agencies and emergency services
  - Preference for other internet sources, direct contact with ES and local announcements
  - Openness to all information sources
- **Group 2:** Independent and fast news
  - Social media preferences co-occur with preference for other internet sources, but not warning apps
- **Group 3:** Prefer more traditional sources such as newspapers, TV and radio.
  - This group is not very open to crisis apps

Pearson's r	Crisis app	Social media (SM)	Contact to ES	Local announcements	Personal conversations	TV	Radio	Other internet services	Newspaper
Crisis app	1	**0,327**	**0,420**	**0,401**	0,259	0,205	0,253	**0,456**	0,219
SM	0,27	1	0,206	**0,316**	0,188	0,296	**0,309**	**0,494**	0,19
Contact to ES	**0,393**	0,206	1	**0,447**	**0,318**	0,26	0,297	0,225	0,156
Newspaper	**0,14**	0,190	0,156	0,281	0,2	**0,465**	**0,424**	0,237	1

Correlation of Helpfulness of Information Sources for Those Who Have Experienced an Emergency (N=827), $p < 0.001$

4. Results

Organizational Preferences

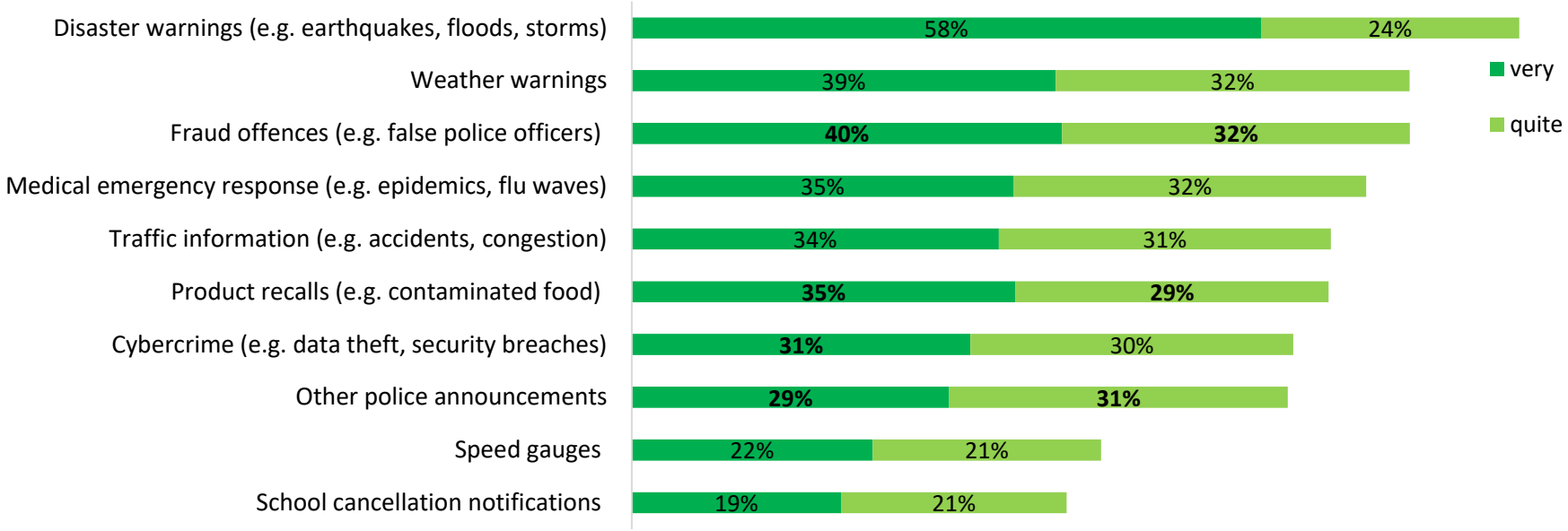
- Agency use of warning apps is regarded as desirable (69%)
  - Since 2017: perceived as more useful than social media
- They should **add apps to existing channels** (65%) instead of replacing them (41%)
  - Redundancy accepted, predominantly not perceived as add-in to information overflow
- ¾ are prepared to **transmit videos and photos** to emergency services
  - 60% would also transmit live in an emergency
- Centralization strongly desired: Strong preference for only **one** warning app (65%)
  - Organizational rather than technical challenges?
- Surprising support for warning apps being **pre-installed** on smartphones (55%)
  - But contested whether it should then be deletable (35% in favour vs. 37% against)

Further configuration preferences can be found in the paper

4. Results

Importance of new warning types

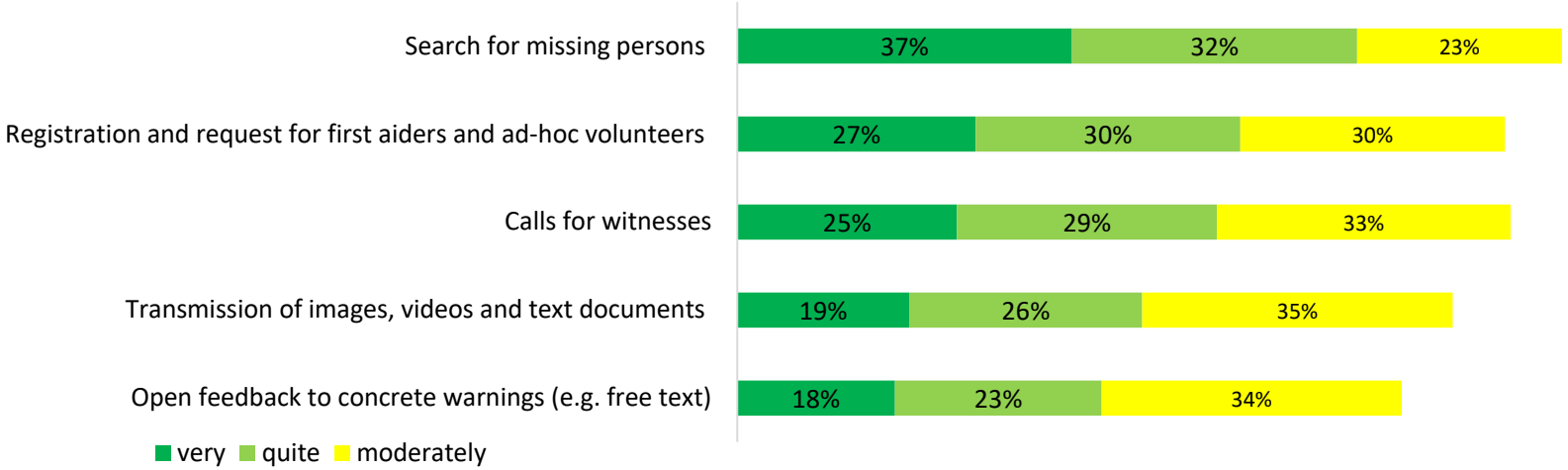
- Classic crisis warning prevails, but crime related types also rated as very important:
  - especially fraud, product recalls and cybercrime



4. Results

Citizens as Contributors

- Forms of participation are regarded as equally important as weather warnings:
  - Search for missing persons (69%) vs. weather warnings (71%)
- Participation primarily as active helpers rather than as ‚remote sensors‘
- Search for missing persons frequently mentioned in top 3 most important app functions



Results

Influence of Socio-Demographic Factors Negligible

Age

- Coding & Methods:
- Tested as binary variable with Mann-Whittney-U-test & ANOVA
- Age groups: <25 years; over 45; over 60
- as continuous variable: with logistic regression

Results:

- Age irrelevant in crisis communication, supporting other international findings (Appleby-Arnold et al., 2019) and findings on social media use in crises (Haunschild, Kaufhold and Reuter, 2020)
- Slight differences regarding usability for the elderly and trust in the secure transmission of GPS data to emergency services

- Contests age and gender as a major factor in technology preferences and use
- Implies convergence of behaviour of age groups in emergencies?

Gender

- t-test for independent samples
- Very slight differences regarding interest in some types of warnings, such as police messages and schools cancellations

Urbanization

- No multicolinearity with age
- No significant effects

Education

- No significant effects

5. Discussion

Limitations & Future Work

- Biggest challenges
  - online surveys are **biased** towards people who **engage online**
  - effects of **retrospective** view on crises

German ministry of health's Telegram channel

- Future research
  - explore app use, perceptions and expectations from a theoretical lens
  - Explorative and eliciting research to confirm or refute lack of gender differences
  - Explore organizational challenges which inhibit the introduction of one centralized app in Germany
  - Explore competition and complementarity with other online channels such as news apps – which appear more relevant during Covid-19 pandemic than warning apps (Haunschild et al., forthcoming), or messenger broadcasts

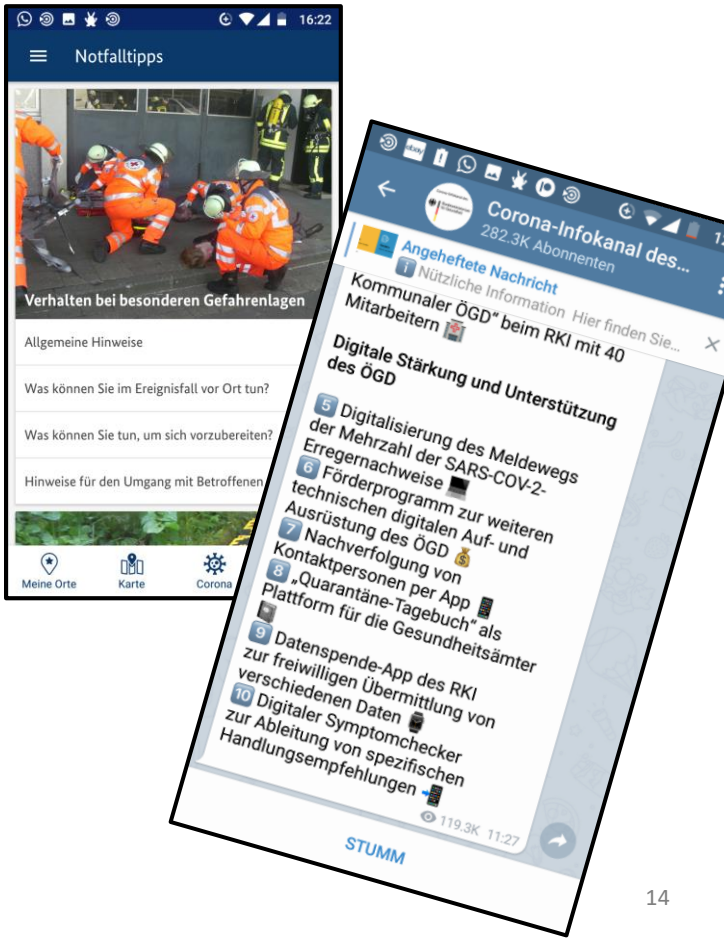
5. Conclusion

- Crisis and warning app use is **on the rise and rated as very relevant**
- Yet, they are relatively unknown and current use is at only 16% in Germany

- **Preference for centralization (only 1 app) and preinstallation on phones**
- Great willingness to receive advice on how to behave in emergencies

- High relevance of functionalities that value citizens as active participants (witnesses and volunteers)
- High relevance of certain crime-related warnings (e.g. fraud and cybercrime), in addition to common extreme weather and disaster warnings
- Multifunctionality should be supported, also to increase use cases of warning apps to justify their permanence

- ***Organizational issues of how to coordinate different ES, including the police, to foster centralization in one app should be explored***



Summary: WARNING THE PUBLIC: A SURVEY ON ATTITUDES, EXPECTATIONS AND USE OF MOBILE CRISIS APPS IN GERMANY

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- In this work, we present the results of a **representative study (N= 1,219)** in Germany
  - RQ1: What is the citizens' **past, current and expected future use and the perceived helpfulness** of crisis apps in comparison to other media channels?
  - RQ2: What are **citizens' preferences** on the **deployment** as well as the **information and warning behaviour** of crisis app?
  - RQ3: What are citizens' demands on **configurability**, required and most important **functionality** of crisis apps? -> please see paper

- **Findings**:
  - Low use (16,5%) and awareness of most crisis apps
  - High ratings of their relevance
  - Preference for apps as additional channels
  - Preference for only 1 centralized app and preinstallation on phones
  - Attractive for user groups that prefer direct communication with ES
  - Better ratings than social media in emergencies
  - Opportunities for active involvement (as witnesses and volunteers) required
  - High relevance of crime-related information in addition to disaster warnings
  - No significant influence of socio-demographic factors

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7. Additional Information

Emergency Experience:

- **68%** had experienced an emergency
- Emergency was defined as an **unforeseeable events (such as epidemics, earthquakes, fires, big accidents or floods) that impact several people and require immediate action to minimize negative consequences.**

Science and Technology for Peace and Security (PEASEC)

What is PEASEC?

Advances in science and technology, esp. in information technology (IT), play a crucial role in the context of peace and security.

PEASEC deals with the **significance of IT for safety, security and peace**.

Especially

- resilience of IT infrastructures (e.g. as a target in cases of conflict) &
- role of IT applications (e.g. interactive and collaborative technologies and social media) to prevent and manage conflicts, crises and disasters

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