



UNIVERSITÀ DEGLI STUDI DI MILANO

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Viable technology, pseudo-medicine?  
A survey on the layperson's knowledge and perception of cryonics

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# Background

- **Cryonics** is a practice by which **corpses** are **preserved** by cooling for an **indefinite** period of time.
- Although it began in the 1960s, it has lately been **spreading** in some developed countries, especially in the **US** and **Russia**.
- What distinguishes it from other forms of corpse disposal (in-ground or above-ground burial, cremation, embalming, etc.) is that cryonics is often carried out in the **hope** of **resuscitation**.

## State-of-the-art

- **Few academic studies**, so far, have dealt with the medical aspects connected with possible reviving following **cryopreservation** or C-P (PubMed contains 18 articles about cryonics between 1979 and 2018).
- A slightly higher number of works address the subject from the social/sociological perspectives (e.g. Sheskin 1979, Quigley 1996), but most publications are by supporters of the practice, often involved in the companies selling cryopreserving services (e.g. Blair-Gile 1994, Cryonics Europe 2002).
- The authors of this abstract have produced initial studies on cryonics from the medical and the linguistic (Grego 2019 and 2020 forthcoming) standpoints.

# Aims

- This study aims to survey the **opinion of laypeople** about **cryonics**.
- The study is expected to return insights on
  - a) the scientific and technical **knowledge** of the practice among laypeople;
  - b) the perception of the **ethical** issues surrounding it, if any;
  - c) the overall **disposition** of laypeople toward an increasing practice.

## Method

- A **questionnaire** to this end has been **developed** and is currently being administered in Italian and in English, among speakers of these languages.
- Questionnaire developed by B. Ciprandi within the field of Legal medicine and insurance law and also influenced by previous studies on the preservation of **corpses in forensic pathology** (Ciprandi et al. 2017, Franceschetti et al. 2017).
- Results will be furthermore interpreted from a **critical discourse studies** perspective (Fairclough 1992, 2003, 2018; Wodak & Meyer 2001; Rajah 2018).

## Questionnaire: construction

- Initially **built in Italian** for administration to an Italian public
- Then **translated into English**
- Administered as a **survey** via [SurveyMonkey](#)
- Questionnaire shown here is the **English** version

# Questionnaire - Introduction

## 1. Welcome to our survey

Cryopreservation, or hibernation, is a newly developed technology that offers the possibility of being "preserved", in the hope that medical developments can make it possible, in the future, to treat currently incurable diseases and to consequently restore one's vital functions.

Technically, a person who, in life, chooses to rely on this technology, is subjected to a rapid cooling process within a few minutes of his/her death (which must therefore take place in a hospital), while the cardio-respiratory activity is artificially maintained and they proceed to inject heparin in order to avoid ischaemic and coagulative damage. The body is then perfused with a solution called "cryoprotector", in order to prevent the formation of ice crystals, and further cooled down to a temperature of  $-120^{\circ}\text{C}$  ("vitrification"). Finally, the body is immersed and stored in liquid nitrogen, at a temperature of  $-196^{\circ}\text{C}$ , hoping that, one day, the pathological condition that led to one's death can be cured, any damage caused by freezing repaired, and the person brought back to life.

Currently, four companies worldwide (three from the United States and one from Russia) offer this service, with costs approximately from \$ 36,000 to \$ 200,000. The phenomenon appears to be booming: in addition to the already cryopreserved 'patients', who amount to over 350 in total, more than 2000 people have entered into a contract in order to be hibernated after death.

This study aims to probe public opinion on the issue. Thank you in advance for your contribution.

# Questionnaire - Profiling

**2. Your profile**

\* 1. Sex

Male

Female

\* 2. Main occupation

\_\_\_\_\_

\* 3. Education

<input type="checkbox"/> Primary school	<input type="checkbox"/> Bachelor's degree
<input type="checkbox"/> Lower secondary school	<input type="checkbox"/> Master's degree
<input type="checkbox"/> Secondary school	<input type="checkbox"/> PhD

\* 4. Nationality

\_\_\_\_\_

\* 5. Year of birth

\_\_\_\_\_

## Profiling of respondents:

- Sex\*
- Main occupation
- Education
- Nationality
- Year of birth

\* No other choices were given for cultural reasons: Italian audience, main religious view, reaching lower educational levels. Different options for English-speaking audience?



# Questionnaire - Religious beliefs

## 3. Religious views

\* 6. How would you define yourself?

- I believe
- I do not believe

Profiling of respondents:

- Sex\*
- Main occupation
- Education
- Nationality
- Year of birth

All required

\* No other choices were given for cultural reasons: Italian audience, main religious view, reaching lower educational levels. Different options for English-speaking audience?

## Questionnaire - Pro or against C-P

5. Are you in favour or against it?

\* 8. Would you say you are for or against cryopreservation?

In favour

Against

# Questionnaire - Organ donation and Corpses for research

## 8. Other questions on end-of-life issues

! This question requires an answer.

\* 12. Are you a registered organ donor, or anyway are you in favour of organ donation for therapeutic transplants?

Yes

No

! This question requires an answer.

\* 13. Would you be in favour of using human corpses for scientific research or surgical practice?

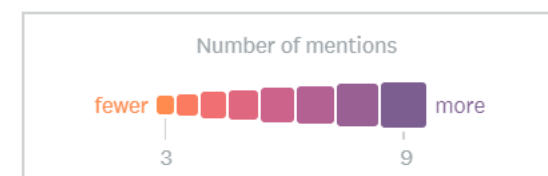
Yes

No

# Results

- **Period of survey:** May 11 - 20 June 2020 (ongoing)
- **Answers:** 60
- **Respondents:**
  - **Sex**
    - Females: 41 (68.33%)
    - Males: 19 (31.67%)
  - **Education**
    - Lower secondary school: 1 (1.67%)
    - Secondary school: 8 (13.33%)
    - University degree (3 years): 30 (50%)
    - Master's degree (4+ years): 16 (26.67%)
    - Doctorate: 5 (8.33%)
  - **Nationality**
    - Italian: 90%
    - Other: 10%
  - **Age:** 1961 to 1999

1975 1976 1996 1978 1997 1995



## Respondents

### Religion:

- Non Believer: 38 (63.33%)
- Believer: 22 (36.67%)

### Are you in favour or against **C-P**?

- In favour: 41 (68.33%)
- Against: 19 (31.67%)

### Are you in favour or against **organ donation**?

- Yes: 46 (82.14%)
- No: 10 (17.86%)

### Are you in favour or against the use **corpses for research purposes**?

- Yes: 48 (85,71%)
- No: 8 (14.29%)

# Initial analysis

Focus on 4 aspects, for the moment:

1. **Sex**
2. **Religious beliefs**
3. **Organ donation**
4. **Corpses for research**

of respondents *against* cryopreservation (19 or 31.67%).

# Initial analysis


## Breakdown by respondent

Respondent	C-P	Sex	Year of birth	Believer	Organ donation	Corpses for research
1	Against	Male	1982	No	No	Yes
2	Against	Female	1997	Yes	Yes	No
3	Against	Female	1967	No	Yes	Yes
4	Against	Male	1974	Yes	Yes	Yes
5	Against	Female	1993	No	Yes	Yes
6	Against	Female	1961	Yes	Yes	Yes
7	Against	Female	1978	Yes	Yes	Yes
8	Against	Female	1967	Yes	Yes	Yes
9	Against	Female	1995	No	Yes	Yes
10	Against	Female	1997	Yes	Yes	Yes
11	Against	Female	1995	No	Yes	Yes
12	Against	Female	1996	No	Yes	Yes
13	Against	Female	1995	No	Yes	Yes
14	Against	Female	1995	No	Yes	Yes
15	Against	Female	1983	No	Yes	Yes
16	Against	Female	1995	Yes	Yes	Yes
17	Against	Female	1996	Yes	Yes	Yes
18	Against	Female	1996	No	Yes	Yes
19	Against	Male	1972	No	--	--

# Preliminary conclusions

Against C-P	1. Sex		2. Believers		3. Organ donation		4. Corpses for research	
19/60	<i>female</i>	16	<i>yes</i>	10	<i>pro</i>	17	<i>pro</i>	17
	<i>male</i>	3	<i>no</i>	9	<i>against</i>	1	<i>against</i>	1
					<i>no reply</i>	1	<i>no reply</i>	1

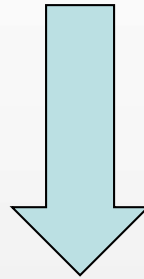
Focus on 3 aspects, for the moment:

1. Sex
  2. Religious beliefs 
  3. Organ donation
  4. Corpses for research
- Sex strongly influences against C-P
  - Religion only slightly influences against C-P
  - C-P does not influence against organ donation or corpses being used for research



## Limits and future developments - *Work in progress*

- **Ongoing** collection and analysis of results
- **Mostly limited** to Italy (primary audience at first)
- **Further data** to analyse
- **Answers to open questions** especially interesting



- **Expand** audience with English-language version
- **Localise** questionnaire for international audience(s)
- Continue following **evolution of cryonics industry** and **social perception**
- **Expand both medical and linguistic interpretations**

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# Thank you

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